THE JACKSON LABORATORY / BAR HARBOR, MAINE
TEL. 207-288-3371 04609

29 July 1985

MS 16
P7

Mr. Thomas Thompson
U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Thompson:

In reference to our telephone conversation of 26 July 1985, please find enclosed the information you requested in regard to our application for renewal of License No. 18-02774-01 submitted 12 July 1985.

1.) Norland Corp. Sealed Source I^{125}, Model 178A591A.
The model number was incorrectly listed as 178A519A.

2.) Rules for leak testing of sealed sources.
Exceptions to Leak Test Requirements.
No leak tests will be required when: The source contains 100 microcuries of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

This replaces the leak testing exception outlined previously as: "Any sealed source, provided the quantity of byproduct material contained does not exceed ten times the quantity specified in Schedule B, Section 30.71, 10 CFR 30."

3.) Additional specifications for low level waste storage facilities:

Main Lab Storage Room - This room is located in the basement of the main laboratory. It is constructed of 8 inch poured cement floors and walls, which have been sealed for ease of decontamination. The electrical system is sparkproofed as a safeguard for solvent storage. A carbon dioxide fire extinguisher is located in the room and emergency procedures promenently posted. The room is located on a downward grade and has no history of flooding. It is also isolated from internal plumbing, so flooding of this nature is highly unlikely. The one door is locked at all times and is a checkpoint for our after hours security force which makes hourly rounds. This room has been used for this purpose for a number of years with no problems.

02310

Small Storage Building - This small building was recently constructed specifically for the storage of low level radioactive waste. It is built on a 10 X 13 ft. concrete slab, on raised ground. The slab has a two inch lip around its perimeter to contain any possible leakage. The building is 22 gague galvanized steel contruction with a metal door, frame and lock set. The floor has been sealed and the building ventilated and tested for its suitability under various weather conditions. A carbon dioxide fire extinquisher is located in the building and emergency procedures posted. The door of the building is locked at all times and once again a checkpoint for our security team.

This building is located as to be near our incineration facilities and is more intended for interim storage for decay to background and eventual incineration, than long term storage.

4.) Calibration of survey instruments: In lieu of our present method of returning survey instruments to the manufacturers for routine calibration, we wish to establish an in-house calibration program.

A. Survey instruments will be calibrated at least annually and following repair.

B. Calibration will be preformed at two points on each scale used for radiation protection purposes.

The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument will be considered properly calibrated when the instrument readings are within +/- 10 percent of the calculated or known values for each point checked. Readings within +/- 20 percent are considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret readings to within +/- 10 percent. Also, when higher scales are not checked or calibrated, an appropriate precautionary note will be posted on the instrument.

C. The source used for the above calibrations will be 100 millicurie Cesium-137, NBS traceble, doubly encapsulated in TIG welded stainless steel. New England Nuclear NER-401H.

D. The calibration procedures in Section I of Appendix D Regulatory Guide 10.8 will be used.

5.) As you suggested, we have reviewed our requested possession limits for the license in light of the fact that we want to establish long term storage capability should we be unable to ship off site. Included in these changes is provision for the Cs^{137} sealed source to be purchased for survey instrument calibration. This revised possession limit request is attached.

6.) Enclosed is a copy of correspondence sent to the State of Maine Department of Enviromental Protection, notifying them of our incineration plans.

Thank you for your help and prompt attention to this renewal application. Please contact Fred Driscoll (207) 288-3371 Ext 265 if there are further questions.

Sincerely,

Robert M. Howell, P.E./C.P.E.
Director of Engineering
Facilities and Maintenance

Frederic J. Driscoll III
Radiation Safety Officer

ITEM 5. RADIOACTIVE MATERIAL

5a. Element and Mass Number	5b. Chemical and/or Physical Form	5c. Maximum Amount to be Possessed at Any One Time
(1) Any byproduct material with atomic numbers 3-83 except as specified below.	(1) Any	(1) One humdred millicuries of each radionuclide with atomic numbers 3 to 83, with a total possession limit of 5 curies except as specified below.
(2) Hydrogen-3	(2) Any	(2) 10 curies
(3) Carbon-14	(3) Any	(3) 500 millicuries
(4) Sulfur-35	(4) Any	(4) 200 millicuries
(5) Phosphorus-32	(5) Any	(5) 200 millicuries
(6) Iodine-125	(6) Any Sealed Source Norland Corp. Model 178A519A	(6) 800 millicuries
(7) Asium-137	(7) Any Sealed Source New England Nuclear NER-401H	(7) 200 millicuries

THE JACKSON LABORATORY / BAR HARBOR, MAINE
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10 July 1985

Mr. George Seel
Dept. of Enviromental Protection
Bureau of Oil & Hazardous Materials
State House Station 17
Augusta, ME 04333

Dear Mr. Seel:

The Jackson Laboratory is in the process of renewing its U.S. Nuclear Regulatory Commission Materials License No. 18-02774-01. The completion of this application requires that we ascertain that our proposed incineration program meets applicable regulations of state and local jurisdictions in regard to the incineration of radioactive waste materials.

I have enclosed the pertinent sections of our license application along with a copy of 10 CFR, Part 20 and Incineration Guidelines for Medical/Academic Licensees. Relevant passages have been marked in red.

It is understood that approval of these guidelines for incineration of low-level radioactive waste will be for that particular aspect of our Maine DEP Air Emissions License application only. Our Maine DEP Air Emissions License will be approved in toto, along with final NRC approval before any of the outlined incineration of low-level radioactive waste will begin.

I feel that our low-level radioactive waste management program could well serve as a model for other generators in the state, as long term plans for low-level radioactive waste disposal are formulated in response to the Federal Low-Level Radioactive Waste Waste Policy Act 1986 deadline. Please contact me if further information is needed in regard to this request or if you have further interest in our waste management program.

Thank you for your prompt attention to this important matter.

Sincerely,

Frederic J. Driscoll III

Frederic J. Driscoll III
Radiation Safety Officer

INCINERATION GUIDELINES FOR MEDICAL/ACADEMIC LICENSEES

You do not need specific NRC approval in order to incinerate certain categories of radioactive waste. Please review Enclosures 1 and 2 in order to determine whether you may proceed without a specific license amendment. If an amendment is required, be certain to make a complete and detailed submission of all information requested below:

1. Submit the characteristics of the incinerator such as height of the stack, height of and distance to buildings in the surrounding areas, rated airflow of the incinerator in cubic feet per hour or similar units and its proximity to any air intake ducts.

2. State specifically the isotopes and the maximum amount of each isotope that you wish to incinerate per burn. For the combination of isotopes listed, submit calculations to demonstrate that the following conditions have been met:

   A. The gaseous effluent from the incinerator stack should not exceed the limits specified for air in Appendix B, Table II, 10 CFR Part 20 when averaged over a 24 hour period.

   B. In order to be in compliance with the ALARA philosophy stated in section 20.1(c), 10 CFR Part 20, the gaseous effluent from the incinerator stack should be a fraction (approximately 10%) of the limits specified for air in Appendix B, Table II, 10 CFR Part 20, when averaged over a period of one year.

   If more than one isotope is involved, your calculations must follow the "sum of ratios" method in the "Note" at the end of Appendix B, 10 CFR Part 20.

3. State the maximum number of burns to be performed in any one week and the maximum number of burns per year.

4. A. Describe your method for measuring or estimating the concentration of radioactive material remaining in the ash residue. Unless you present scientific evidence to the contrary, you must use the most conservative assumption.

   B. Submit your procedures for collection, handling and disposal of the ash residue, including radiation safety precautions to be observed.

5. Describe procedures to be followed to minimize exposure to personnel during all phases of the operation, including instruction given to personnel handling the combustibles and the ash.

* 6. Submit evidence (e.g., copies of outgoing and incoming letters) to show that all State and local jurisdictions have been notified of your plans to incinerate radioactive waste and have no objections to them.

Enclosures:
1. 12/1/80 letter to all medical licensees
2. Biomedical Waste Disposal Rule

These are covered now by 10CFR 20.306

* TAKE SPECIAL NOTICE OF THIS REQUIREMENT

ALSO READ 10CFR 20.106(b), 20.302, 20.305, 20.306 20.201 Surveys Appendix B TABLE II

ITEM 9.FACILITIES AND EQUIPMENT

Throughout most of the complex covered by this license, standard laboratory facilities and equipment are in use and provide adequate controls. Most studies utilizing radioisotopes are conducted in the laboratory of individual investigators. Individual laboratories are equipped with sinks, stand-up and sit-down work benches, refrigerators, etc. and either have fume hoods or ready access to a fume hood. Refrigerators and freezers associated with individual laboratories are authorized for storage of radioisotopes in accordance with Radiation Safety Committee approved possession limits and storage regulations.

Radioisotopes Hot Laboratory - This laboratory is located on the second floor of the Main Laboratory (Radioisotope Suite) and is designated on Floor Plan #1. Rules for its use are provided to all investigators (Appendix Item 7). The Hot Lab is used for all iodination procedures, working with radioiodine compounds above 1.0 millicurie, and all other procedures so indicated by the Radiation Safety Committee in their review of applications for use of radioactive materials.

The hood in the Hot Lab is an outside ventilating device in operation 24 hr/day. The air flow rate through the Hot Lab is 1.337×10^{11} ml/7 days and is measured by hot-wire anemometer annually or more often if hood fan servicing is necessary. The Hot Lab also contains workbench space, stainless steel sink, freezer for storage of chemicals or contaminated animal carcasses, and a small well-shielded storage area for lead pigs containing stock solutions of radioisotopes. Special equipment available for use during execution of procedures is the Hot Lab consist of:

1. Variable rate of flow 1 to 20 L/min air pump (Bendix Model 19102) with in-line device that holds activated charcoal or other appropriate filters.

2. Fixed rate of flow (2 L/min) air pump (Fisher Scientific Model 18-309X) with in-line device that holds activated charcoal or other appropriate filters.

3. Nuclear Equipment Chemical Corporation survey meter Model H-572 assigned solely to the Hot Lab for monitoring contamination.

4. Mini-hood - Activated charcoal filtered hood for radioiodine control, with one cubic foot of working space. Integral blower capable of pulling 100 ft^3/min with approximately 75 linear ft/min face velocity. Used within the existing fume hood in the Hot Lab.

5. Glove Box - Disposable Aldritch AtmosBags are used in situations where the Radiation Safety Committe has dictated that operations be carried out in a glove box. These controlled atmosphere chambers with built-in gloves are available in the Hot Lab.

Radioactive Waste Processing Area - This area is located in the Radioisotope Suite and is designated on Floor Plan #1. Radioactive waste generated in the individual laboratories is brought to this area for further processing, segregation by half-life, packaging for storage, or shipment, and final disposal preparation.

All radioactive waste material from animal housing rooms(Floor Plan #1) comes directly into this processing area for treatment and disposal. Disposable animal cages used for radioisotope studies are directed to the appropriate waste stream.

This area is equipped with a sink and has ready access to the Hot Laboratory for waste processing procedures requiring a fume hood, or more rigid control and monitoring methods. A survey meter is available at all times in this area. Room surveys and wipe tests are done at least weekly.

These rooms are locked at all times. Access is restricted to the Radiation Safety Office Staff and registered radiation workers who have a need to be in the area.

Radioactive Waste Storage Facilities - There are two isolated areas at the Laboratory designated as storage areas for radioactive waste. See Floor Plan #2 and Campus Map. These areas are properly ventilated and prepared for easy decontamination, if necessary. The need for additional shielding of these areas does not exist at this time. Adjacent unrestricted areas are identified on the above diagrams, radiation levels in adjacent unrestricted areas will not exceed the requirements of 10 CFR 20.105.

Radiation levels in the storage areas will be surveyed and recorded at least weekly. These areas will be used for our storage for decay program as well as a holding area for materials to be shipped off site to a licensed disposal site. Both areas will be locked at all times. Access is restricted to Radiation Safety Office staff and registered radiation workers who have a need to be in the areas. Security personnel routinely patrol the outside perimeters of the areas during off hours.

Incinerator Facilities - The Burnzol Pathological Waste Incinerator (Model LB-200) is located in a separate utilities building(Campus Map), approximately 125 meters from the Main Laboratory building, 50 meters from the carpentry and maintenance shop and adjacent to general purpose storage buildings. The Burnzol unit is approximately 62 meters from the Jackson Laboratory boundary and at least 400 meters from the nearest residence. The nearest air intake ducts are located at the Main Laboratory.

Other characteristics of the Burnzol unit are capacity, 200 lb waste/hr; fuel, propane; operational temperature, 1600-2000 F; stack height, 6.2 meters; measured exhaust stack flow rate, 8.04×10^{10} ml/hr. The required negative pressure in the incinerator is maintained by a draft Inducer, located in the stack above the roof.

Liquid Waste Injection System - The Burnzol incinerator unit will be modified to accept a liquid waste burner, for introduction of volatile liquids in the secondary chamber. This provides approximately 2 seconds retention time at 1600 F when fired at a rate of 2.5 to 3 gallons per hour. The liquid waste burner is a Maxon 508 oven pack burner rated at 800,000 BTU/hr maximum input, with a turndown ratio of 20:1. The flame is maintained by an electronic flame safeguard system with UV scanner. The

fuel trains include liquid waste, atomizing air and gas pilot. The burner is equipped with an integral combustion air blower.

The liquid waste is pumped from the storage drum with a Viking positive displacement pump which features a suction filter, flow switch and flow scope indicator. The operating controls include the necessary safety interlocks, solenoid valves, relays and indicators for safe combustion of the liquid waste material.

Hoods - Laboratory hoods used for storage or work with radioisotopes are designated as such, and are required to provide a face velocity of at least 100 fpm under normal working conditions. These hoods are routinely monitored for contamination and function. Face velocity measurements are done and recorded at intervals of no more than 6 months.

Personnel Dosimetry Equipment - Film badge, TLD'S are supplied by R. S. Landauer Jr. & Company, Glenwood, Il. 60425, on a monthly basis.

Radiation Detection Equipment and Calibration

1. Survey meters:

a. Nuclear Chicago 2650M, Johnson CSM-5, Eberline E-120, and Nuclear Equipment Corp. H-572 are calibrated by Warington, Inc., 7801 North Lamor, D-111, Austin, TX 78752, License #NRC-6-3074. Victoreen 470-A and 493 are calibrated by Victoreen Instrument Division, 10101 Woodland Ave., Cleveland, OH 44104, License #NRC-34-00486-04.

b. These instruments will be calibrated annually and after servicing.

2. Research gamma and beta counters:

a. Nuclear Chicago Model 1185 (Main Laboratory) - method, frequency and standards used in calibrating gamma counter for testing: (1) surface wipe samples and (2) thyroid bicassays.

(1) Calibration of elevator-access deep well scintillation crystal through use of:

(a) Simulated ^{125}I (^{129}I; 0.1 mCi, Nuclear Chicago No. S-600)

(b) Simulated ^{131}I (^{133}Ba and ^{137}Cs; 0.28 mCi 10/14/74; New England Nuclear NES-214)

(c) ^{137}Cs (0.1 mCi $\pm$ 10%; 4/71; Amersham/Searle No. 184642) Calibration is carried out for the deep well crystal at least once a year for the above source. Verification of at least one source is made each time the deep well crystal is used to check surface wipes for contamination. On at least an annual basis, additional calibration will be made with ^{51}Cr, ^{59}Fe, or other short-lived radioisotopes that may be obtained for research purposes. These calibration sources are obtained from New England Nuclear Corp.

(2) Calibration of the special 5 cm (dia.) external scintillation crystal used for thyroid bioassays is accomplished with the same sealed sources described in (1) above. Each time thyroids are counted, calibration of the equipment is carried out with a phantom containing 2.5 cm water between the radioactive source and scintillation crystal.

b. Packard Tricarb 300C (Main Laboratory) - Method, frequency, and standards used in calibrating beta counter for testing (1) surface wipes and (2) urine bioassays.

(1) Calibration of dual channel crystals through use of:

(a) ^{3}H (255200 DPM, 27 Nov 79, Packard, Serial No. 322)

(b) ^{14}C (103000 DPM, 26 Feb 80, Packard, Serial No. 322)

(2) Calibration is carried out multiple times monthly with one or both of the above standards during research use and during surveys of surface wipes, effluent samples, ash, or biological specimens (i.e., urine) for presence of radioactive contamination. On at least annual basis, additional calibration will be carried out with calibrated standards of short half-life radioisotopes such as ^{32}P, ^{35}S, or other radioisotopes that may be obtained for research. These calibrated sources are purchased from New England Nuclear Corp.

(3) The Radiation Safety Office has assembled the above equipment and supervises the use of that equipment and thyroid bioassays. Ms. K. Hagberg, Manager, Personnel Health Service is also trained in the bioassay procedures.

c. The other research gamma and beta scintillation counters are calibrated on site frequently with standard isotopes of known activity described as are. Calibration is carried out with one to two different isotopes with calibration standards obtained from several vendors, including New England Nuclear (Boston, MA), Amersham/Searle (Downers Grove, IL), Nuclear Chicago (Chicago, IL), LKB-Wallace (Gaithersburg, MD), and Packard Instruments (Downers Grove, IL). In addition, service personnel from Gamma Sonics (Hopedale, MA 01747; Nuclear Chicago Instruments), Beckman Instruments (Beckman Instruments), Packard Instruments (Tricarb 300 C), and LKB-Wallace (RackBeta models 1211 and 1217) make frequent visits to the Jackson Laboratory for the purpose of repair and calibration of the respective vendors' instruments. These visits typically occur more frequently than once a year.

XV. WASTE DISPOSAL

All radioactive waste disposal is managed by the Radiation Safety Office. Laboratories which handle unsealed radioactive material are equipped with radioactive waste containers which are clearly marked "Caution, Radioactive Waste, Do Not Empty ". These receptacles are emptied on request, or as the radiation levels become significant. All waste material that is contaminated with radioisotopes at any level should be disposed of as radioactive waste.

Pertinent information to ensure that the volume of low level radioactive waste is minimized and that such waste is processed into acceptable chemical or physical form prior to ultimate disposal is provided to personnel during initial and refresher training. Material must not be put into radioactive waste collection containers if there is a possibility of a chemical reaction during storage or shipment that may cause the release of radioactive gases, fire or explosion. Volatile or potentially volatile radioactive wastes should be appropriately treated with strong alkali, detergent or acid whenever possible to render radioactive material non-volatile.

As any receptacle is being filled, records must be kept of the date, isotope and quantity being placed in the containers. The procedures for disposal of the various types of radioactive waste generated are as follows:

DRY SOLID WASTE

A. This category forms the bulk of radioactive waste generated at the Jackson Laboratory. Due to increasing restrictions on low level radioactive waste disposal, we have requested permission to segregate and store for decay to background, wastes with half-lives of less than 100 days. Waste segregated and stored for this purpose will be carefully monitored after storage for at least 10 half-lives before being incinerated as normal trash. Monitoring will be done:

a. in a low background area
b. with a low level GM type survey meter appropriate for contamination surveys, using the most sensitive scale
c. with all shielding removed

Non-combustible waste will be similarly stored and monitored prior to disposal as part of the sanitary waste stream. Permanent records will be kept of all such monitoring, which will also serve to assure that radioactive labels have been properly obliterated or removed.

The storage areas for decay will be under the control of the Radiation Safety Office and be properly secured from unauthorized access. The containment vehicles for this waste will be standard DOT 7A 55 gallon drums with plastic liners. All drums stored in this way will be clearly identified, dated and properly cataloged. To insure the safety and integrity of the storage process, these materials will be monitored and controlled at all times. Weekly surveys will be done and recorded to ensure that radiation exposure levels do not present a hazard. Adjacent unrestricted areas may not exceed limits specified in 10 CFR 20.105.

B. Combustible dry solid waste that is not held for decay to background, will be segregated and incinerated in our Burn-zol Pathological Waste Incinerator (Model LB-200) which was purchased as a replacement for the Silent-Glo unit in which such waste was formerly incinerated under our license. The Burn-zol incinerator is licensed as a Class VI Incinerator by the State of Maine, Department of Environmental Protection (License No. 1339). Confirmation that all appropriate state and local regulations concerning incineration of radioactive material have been met, will be submitted to the NRC. Log books are maintained recording dates, specific isotopes and quantity of isotope disposed of in this manner. The stack discharge will be controlled by limiting the amount of radioactive material that is incinerated, such that the stack effluent concentration will not exceed the limits in 10 CFR 20 Appendix B, Table II, Column I, when averaged over 24 hours, and will not exceed 10% of these levels when averaged over a one year period. It will be assumed that all radioactive material will be released in the stack effluent in determining the maximum amount of material that may be incinerated.

Ashes from this procedure will be sampled for determination of residual activity. It will be ascertained that concentrations of licensed material appearing in the ash residues do not exceed the concentrations (in terms of microcuries per gram) specified for water in 10 CFR 20 Appendix B, Table II, prior to disposal as ordinary waste. Ash that does not fit these criteria will either be stored for decay and resurveyed or shipped to a licensed disposal site.

All persons involved with these processes will be provided with appropriate training, equipment and monitoring devices. The incinerator will be surveyed before release for unrestricted use.

TABLE 1

Calculations for combustion of waste materials containing radioisotopes in Burn-zol Pathological Waste Incinerator with flow rate of 8.04 x 10^{10}ml/day.

ISOTOPE	10 CFR 20 APPENDIX B Table II Col 1 (uCi/ml)	CALCULATED MP DISPOSAL (uCi/day)	ALARA FRACTION (10% of MPD) (mCi/yr)
^{3}H	$2x10^{-7}$	$1.60x10^{4}$	586.9
^{14}C	$1x10^{-7}$	$8.04x10^{3}$	293.4
^{32}P	$2x10^{-9}$	$1.60x10^{2}$	5.86
^{35}S	$9x10^{-9}$	$7.26x10^{2}$	26.40
^{45}Ca	$1x10^{-9}$	$8.04x10^{1}$	2.93
^{51}Cr	$4x10^{-7}$	$3.21x10^{4}$	1173.0
^{59}Fe	$5x10^{-9}$	$4.02x10^{2}$	14.60
^{75}Se	$4x10^{-8}$	$3.21x10^{3}$	117.3
^{125}I	$8x10^{-11}$	6.43	0.234
^{131}I	$1x10^{-10}$	8.04	0.293

24 hour burn

There will be a maximum of two burns performed in any one week, with no more than 60 burns per year. Overall release will be evaluated in accordance with 10 CFR 20 Appendix B. $\frac{CA}{MPC_A} + \frac{CB}{MPC_B} + \frac{Ci}{MPC_i} \leq 1$ for both individual burns and 1 year period assessments (10% fraction).

C. Solid, noncombustible wastes which are not amenable to storage for decay (half-life > 100 days), are collected in DOT TYPE 7A 55 gallon drums and periodically shipped via HMM Associates, Concord, Massachusetts (NRC Lic.# 20-20795-01) for disposal in a licensed disposal site. All applicable requirements set by the NRC, DOT and Agreement States hosting landfill sites are followed when shipments are prepared. Training for this task is

provided by review of appropriate regulations and telephone conversations with HMM Associates personnel, prior to final packaging and shipment. This assures that all the latest changes are incorporated in our shipment preparations. Our records include detailed accounts of materials disposed of in this manner (dates, isotope, amounts, etc.). The Radiation Safety Office is responsible for the safe transfer, packaging and transport of this low level radioactive material.

Liquid Waste

D. Radioactive waste materials which are soluble or dispersible in water may be disposed of in the sewage system in amounts and concentrations conforming on a Laboratory wide basis to NRC regulations. Only designated sinks/drains may be utilized for this disposal.

TABLE 2

The following table outlines disposal limits for The Jackson Laboratory. Calculations based on 1.68×10^{8} ml/day average sewage system rate.

ISOTOPE	10 CFR 20 Appendix B Table I Col 2 uCi/ml	Calculated MPD uCi/day	ALARA Fraction 10% uCi/day	ALARA Fraction 10% mCi/month(30 d)
^{3}H	1×10^{-1}	1.68×10^{7}	1.68×10^{6}	5.04×10^{4}
^{14}C	2×10^{-2}	3.36×10^{6}	3.36×10^{5}	1.008×10^{4}
^{32}P	5×10^{-4}	8.4×10^{4}	8.4×10^{3}	2.52×10^{2}
^{35}S	2×10^{-3}	3.36×10^{5}	3.36×10^{4}	1.008×10^{3}
^{45}Ca	3×10^{-4}	5.04×10^{4}	5.04×10^{3}	1.512×10^{2}
^{51}Cr	5×10^{-2}	8.4×10^{6}	8.4×10^{5}	2.52×10^{4}
^{59}Fe	2×10^{-3}	3.36×10^{5}	3.36×10^{4}	1.008×10^{3}
^{75}Se	9×10^{-3}	1.512×10^{6}	1.512×10^{5}	4.53×10^{3}
^{125}I	4×10^{-5}	6.72×10^{3}	6.72×10^{2}	2.016×10^{1}
^{131}I	6×10^{-5}	1.008×10^{4}	1.008×10^{3}	3.024×10^{1}

Overall release will be evaluated by the principal of

$$\frac{CA}{MPC_A} + \frac{CB}{MPC_B} + \frac{Ci}{MPC_i} \leq 1$$ in accordance with 10 CFR Appendix B.

No more than 5 times the amount of material specified in the above table column 3 (calculated ALARA fraction uCi/day) will be disposed of in any one day. The quantity of radioactive material released in any one month, if diluted by the average monthly quantity of water released, will not result in an average concentration exceeding 10% of the limits specified in 10 CFR 20 Appendix B, Table I Col. 2. The gross quantity of licensed and other radioactive material, excluding ^{3}H and ^{14}C released into the sanitary sewer system will not exceed 1 Curie per year. The quantities of ^{3}H and ^{14}C released into the sanitary sewer system will not exceed 5 Curies per year for ^{3}H and 1 Curie per year for ^{14}C. Records will be maintained of all such disposal, indicating dates, isotope and quantities.

E. Disposal of larger amounts, or liquids that are not soluble in water must be done under the supervision of the Radiation Safety Office. Insoluble or high level liquid waste should be neutralized (pH 6.5-7.5), collected in inert polyvinyl chloride containers and the Radiation Safety Office notified. All iodine liquid waste should be made strongly alkaline. Contents of polyvinyl chloride bottles should be liquid only. Bottles should be stored in plastic dishpans or metal trays lined with absorbent material to catch spillage or leakage. This material will ultimately be stored for decay and appropriate disposal or solidified and shipped to a licensed disposal site.

F. Combustible liquid waste meeting the criteria outlined previously for incineration of radioactive materials will be incinerated in the Burnzol Pathological Waste Incinerator unit, which will be equipped with a liquid waste injection system.(see section facilities) The burning of this material will be included as part of the procedures, schedules and limitations for incineration stated in B above. Exempt quantities of ^{3}H and ^{14}C (less than 0.05 uCi/gram) will also be disposed of in this manner subject to the restrictions stated in 10 CFR 20 20.306.

G. Animal carcasses which contain radioactive material will be labelled as to date, isotope and quantity of isotope and stored in the Radiation Safety freezers located in the radioisotope suite area or storage for decay areas. After storage for decay, as applicable, these carcasses will be incinerated in accordance with the procedures, schedules and limitations outlined previously for incineration of radioactive material (B).

H. Excess or Unwanted Isotopes and Sources - The Radiation Safety Office must be contacted for disposal of unwanted isotopes or sources to arrange appropriate disposal.

In light of the fact that Maine is unlikely to meet the federal low level Radioactive Waste Policy Act 1986 deadline, and has indicated that waste generators should plan for long range storage of radioactive wastes, we also request permission to store those wastes for which storage for decay is impractical when it is no longer possible to ship to available waste disposal sites. Obviously, we will continue to ship to the Richland, Washington site via our current broker, HMM Associates, as long as possible, but wish to establish the capability for long term storage for long lived wastes in anticipation of the inevitable gap between our ability to ship out of the region and the availability of a waste facility for Maine generators.