



NEW ENGLAND

BioLabs

32 Tozer Road Beverly, MA, U.S.A. 01915

(617) 927-5054

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December 3, 1981

Material Licensing Branch
Division of Fuel Cycle & Material Safety
United States Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406
Attention: Dr. John E. Glenn, Ph.D.

Dear Dr. Glenn:

In response to your letter of October 23, 1981, FCMLB:PCJ, Control Number 08902, the following answers are submitted for your information:

1. Enclosed as Appendix I is the description of the new facility at 32 Tozer Road, Beverly, MA. However, the old facility at 283 Cabot Street will continue to be used as a back-up facility and the use of radioactive materials will not be terminated at this address. Use at this facility will be under the supervision of Dr. Roger Knott.
2. The duties and responsibilities of the radiation officer may be summarized as follows:
 - a. To ensure that the use of radioactive material is by or under the direct supervision of individuals specifically listed on the license.
 - b. To ensure that the purchase orders for radioactive materials are signed in order that only radionuclides, quantities, and forms ordered are listed on the license.
 - c. To ensure that proper receiving and opening procedures are followed.
 - d. To ensure that radioactive materials are properly secured against unauthorized removal at all times when not in use.
 - e. To perform routine surveys of all laboratory areas using or storing radioactive materials.
 - f. To ensure that all users (wherever appropriate) wear personnel monitoring equipment when using radioactive materials, and to avoid any unnecessary exposure either to himself or those working under his supervision (ALARA)

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g. To provide for the basic instruction and training of all persons handling radioactive materials.

h. To ensure that the terms and conditions of the license are met and that all records are maintained.

i. To ensure that proper signs, labels, NRC Form #3, and instructions are posted.

j. To ensure that a calibrated survey instrument is available at all times to those handling the radioactivity.

3. The survey instruments will be calibrated under the supervision of Mr. Robert U. Johnson who has been cleared by the N.R.C. under License #20-00297-53 (Harvard University). The procedures have been approved by the N.R.C. and these will be followed on an annual basis. In addition, the survey meter will be cross-checked with a calibrated survey instrument on a more frequent basis. (At least semi-annually). These calibrations will be on a two-point basis on each scale.

4. All persons currently employed will be instructed in accordance with 10-CFR-19.12 and new persons will be instructed upon employment. Copies will be available for inspection.

5. The radioactive materials are ordered by Dr. Comb who will countersign all such orders. Upon receipt of any radioactive materials, instructions have been given to deliver immediately all packages to him (or his designated appointee if of vacation) for verification of the radionuclide, amount, and form. He will maintain a running inventory of the material on hand to ensure that the possession limits are not exceeded and will place them in a secured area to guard against unauthorized removal. The package will be monitored to determine the dose rate in order that the level in any unrestricted area is not exceeded.

6. Procedures for examining incoming packages include visually inspecting the package to detect any crushing or breakage in transit as evidenced by stains on the package. The receiver must wear gloves, monitor the dose rate with a survey meter, place the package in a hood and wipe test the outer container and inner container to prevent contamination of the work area. Any contamination on the outer surface in excess of 1×10^2 uCi will be reported to the vendor, U.S.N.R.C., and the delivery company. The packing slip will also be cross-checked with the purchase order to eliminate any errors in shipment.

7. The instructions to be posted are basically found in Regulatory Guide 10.8 Appendix G. p. 35. However, in addition, the following instructions are included:

a. Avoid all unnecessary exposure to ionizing radiation.

b. Keep external radiation exposure to a minimum by planning your work habits with minimum exposure in mind. Do not linger unnecessarily in radiation areas.

c. Keep yourself informed of all safety measures pertaining to your work, including the appropriate corrective action in the event of an accident.

d. A notice that copies of 10-CFR-20 and 10-CFR-19 are available for examination through the Radiation Protection Officer .

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8. Emergency Procedures---see Appendix II.

9. The routine area survey program will include a comprehensive monthly survey to include dose rates with a survey meter and wipes off the benches, sinks, hood ledges, and storage areas. Current procurement of 0.25mCi 32P and the resulting use of less than 0.00 lmCi per experiment does not necessitate a survey after every such use. However, any use of levels greater than this will necessitate a survey after use to include the dose measurements, wipe tests, and personnel surveys (hands, clothing, etc.) with the results recorded in such a survey. The records will maintained for inspection by the inspector from the Compliance Division of the N.R.C. The general policy is that no contamination is acceptable which means that any contamination found during the survey will be decontaminated so that no removable activity is left. Any residual fixed contamination will result in subsequent action depending upon the source of contamination and the location as determined by the R.P.O. For example, any fixed 14C or 35S will be shielded after a determination is that it is not removable. 32P will be shielded with lucite or glass and allowed to decay to background at which time the shielding will be removed.

10. Solid radioactive waste will be allowed to decay to background (32P primarily also low levels of 35S) as determined by monitoring with a survey meter to a point at which no detectable contamination can be found. Upon disposal to regular trash, the survey will be recorded in a log that it was monitored and was found to be background. Any pads, glassware, etc suspected of being contaminated with 3H will be disposed in commercial barrels (Interex). In all cases, records will be maintained of all disposal.

11. Appendix III for use of multi-mCi levels of 32P.

a. All new procedures using multi-mCi levels 32P must first be carried out in a dry run prior to any use of 32P to preclude any unexpected complications. This new procedure must directly be supervised by the R.P.O.

b. Personnel monitoring devices including both film badges and finger rings must be worn when handling mCi levels 32P.

c. In order to reduce the personal exposure to a minimum (ALARA), lucite or plexiglass shielding will be used with a recommended thickness of 0.3". The user will be able to observe the procedures through the shielding and the material will minimize the production of bremsstrahlung (x-rays from secondary radiation).

d. Surveys will be carried out immediately following any such use to include monitoring with a survey meter of the personnel, clothing, and facilities. In addition, wipe tests will be made to determine the presence of any contamination. Record will be maintained of the survey.

e. In the event of any accidents, or spills, the R.P.O. WILL be immediately notified and urine samples will be submitted to determine any ingested activity.

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Finally, please note that we wish to increase the maximum number of millicuries of Sulfur 35 that we will have in possession at any one time to 10 millicuries from the present 5 millicuries in our license.

Regards,

Donald G. Comb

Donald G. Comb, Ph.D.
President

DGC/lmb

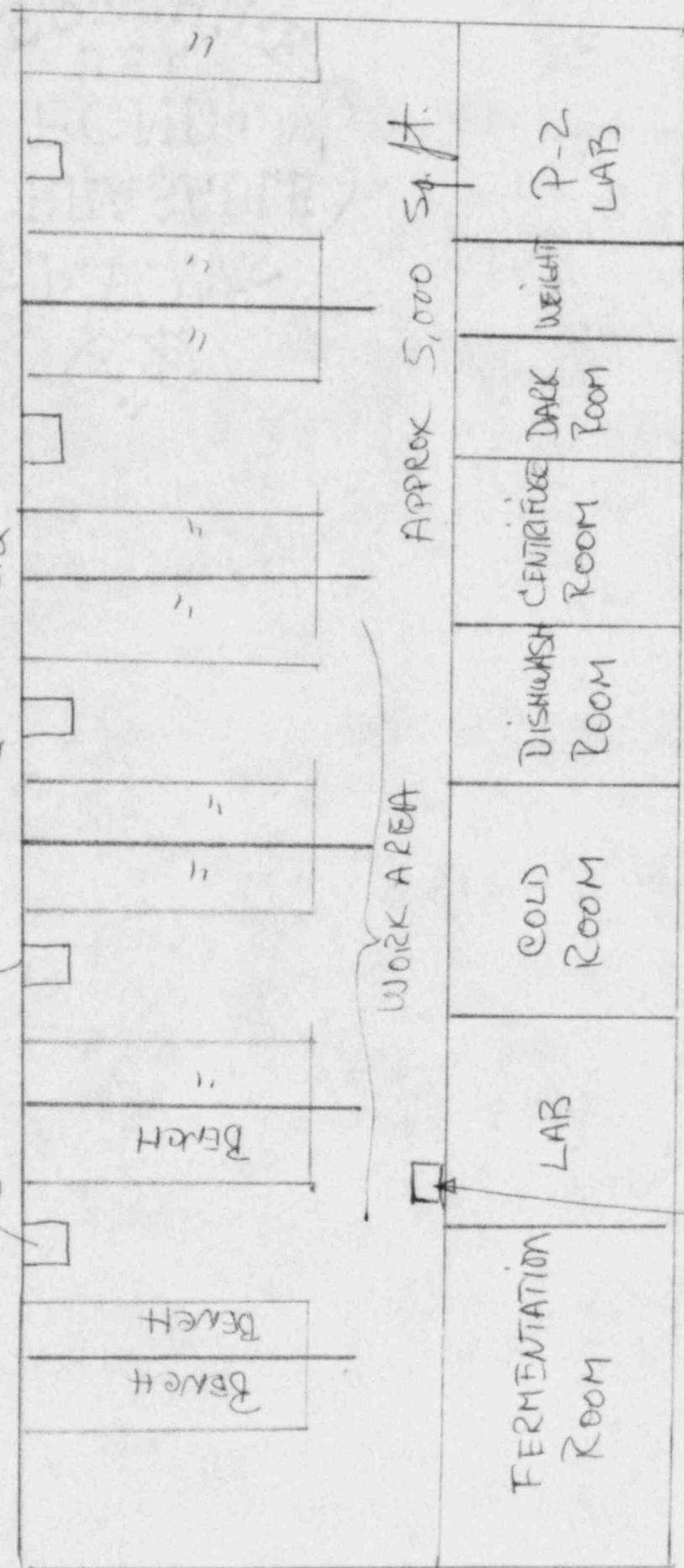
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paragraph*

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APPENDIX I

FOR STORAGE OF
RADIOACTIVE ISOTOPES
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APPENDIX II

EMERGENCY INSTRUCTION IN THE EVENT OF RELEASE OF RADIOACTIVITY AND CONTAMINATION OF PERSONNEL

1. Objectives of Remedial Action

In the event of an accident involving the release of significant quantities of radioactive material, the objectives of all remedial action are to:

- a. Minimize the amount of radioactive material entering the body by ingestion, inhalation, or through any wounds.
- b. Prevent the spread of contamination from the area of the accident.
- c. Remove the radioactive contamination on personnel.
- d. Start area decontamination procedures under qualified supervision. Inexperienced personnel should not attempt unsupervised decontamination.

2. Procedures for Dealing with Minor Spills and Contamination

Most accidents will involve only minor quantities of radioactivity (that is, at the microcurie level).

- a. Put on gloves to prevent contamination of hands. (Wash hands first if they are contaminated as a result of accident.)
- b. Drop absorbent paper or cloth on spill to limit spread of contamination.
- c. Mark off contaminated area. Do not allow anyone to leave contaminated area without being monitored.
- d. Notify the radiation-protection office of the accident.
- e. Start decontamination procedures as soon as possible. Normal cleaning agents should be adequate. Keep cleaning supplies to the minimum needed to do the job and place into sealed bags after use. (Recommendations for difficult jobs may be found in the Radiological Health Handbook, listed in the Selected Bibliography.) Proceed from the outermost edges of the contaminated area inward, reducing systematically the area that is decontamination of highly radioactive areas, which would require supervision by a radiation-protection specialist.)
- f. Put all contaminated objects into containers to prevent spread of contamination.
- g. Assign a person equipped with a survey meter to follow the work and to watch for the accidental spread of contamination.
- h. Continue decontamination until 100 cm² wipes for removable contamination picks up background as measured with the G-M counter, and fixed contamination on surfaces gives off less than 0.2 mr/hr.

4. Personnel Decontamination

The survey technician on the scene of a spill is to supervise personnel decontamination according to the following guidelines:

1. If personnel contamination is suspected, first identify contaminated areas with survey meter. Do not use decontamination methods that will spread localized material or increase penetration of the contaminant into the body (such as by abrasion of the skin). Decontamination of wounds should be accomplished under the supervision of a physician.

2. Irrigate any wounds profusely with tepid water, and clean with a swab. Follow with soap brush, if needed). Avoid the use of highly alkaline soaps (may result in fixation of contaminant) or organic solvents (may increase skin penetration by contaminant).

Use the following procedures on intact skin:

- a. Wet hands and apply detergent.
- b. Work up good lather, keep lather wet.
- c. Work lather into contaminated area by rubbing gently for at least 3 minutes. Apply water frequently.
- d. Rinse thoroughly with lukewarm water (limiting water to contaminated areas).
- e. Repeat above procedures several times, gently scrubbing residual contaminated areas with a soft brush, if necessary.
- f. If the radiation level is still excessive, initiate more-powerful decontamination procedures after consultation with the radiation protection office.
Contamination measured on the fingertips is often sharply reduced by clipping the nails.
- g. Some degrees of fixed contamination may occur, and the following maximum limits are suggested for hands, body surfaces, or personnel clothing and shoes:
Alpha activity - $100 \text{ dis/min/100 cm}^2$
Beta-gamma activity - $0.1 \text{ mrad/hr at 2 cm}$.

5. Major Releases of Airborne Radioactivity as a Result of Explosions, Leakage of High-Level Sealed Gaseous and Powdered Sources

Inside the laboratory:

- a. If possible, cut off the release of radioactive materials from the source to the environment, but avoid breathing in high concentrations of radioactive material. Wear your respirator, gloves and boots. Close windows.
- b. Evacuate room and close doors. Remove contaminated shoes and laboratory coats at laboratory door to avoid tracking radioactive material around.
- c. Report incident to radiation-protection office.
- d. Shut off all ventilation, heating, and air-conditioning equipment that can transport contaminated air from the laboratory to other parts of the building.

Outside the laboratory:

- f. Seal doors with tape if airborne material is involved and if there is no net flow of air into room (that is, as a result of exhaust through hoods).
- g. Lock or guard the doors and post appropriate signs warning against entry.
- h. Assemble in nearby room with other personnel suspected of being contaminated. Wash off possibly exposed areas of the skin, if there is a delay in performing a survey. Do not leave the control area until you have been thoroughly surveyed for contamination. (Personnel decontamination measures should be instituted promptly if significant contamination is found.)
- i. Major decontamination jobs should be attempted only by personnel experienced in radiation protection.