

CUNY Advanced Science Research Center (ASRC)

RADIATION SAFETY PLAN

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I. ALARA PROGRAM

Management Commitment

- a) The CUNY Advanced Science Research Center is committed to the program described herein for keeping individual and collective exposures As Low As Reasonably Achievable (ALARA). In accord with this commitment, we hereby describe an administrative organization for radiation safety and will develop the necessary written policy, procedures, and instructions to foster the ALARA concept within our institution. The organization will include a Radiation Safety Committee (RSC) and a Radiation Safety Officer (RSO).
- b) There will be a formal annual review of the radiation safety program, including ALARA considerations. This will include reviews of operating procedures and exposure records, inspections, etc., and consultations with the radiation safety staff or outside consultants.
- c) Modifications to operating and maintenance procedures and to equipment and facilities will be made if they will reduce exposures whenever and wherever possible.

Radiation Safety Committee

a. Review of Proposed Users and Uses

- (1) The RSC will thoroughly review the qualifications of each applicant with respect to the types and quantities of materials and methods of use for which application has been made to ensure that the applicant will be able to take appropriate measures to maintain exposure ALARA.
- (2) When considering a new use of radioactive material, the RSC will review the efforts of the applicant to maintain exposure ALARA.
- (3) The RSC will ensure that users justify their procedures and that individual and collective doses will be ALARA.

b. Delegation of Authority

- (1) The RSC will delegate authority to the RSO for enforcement of the ALARA concept.
- (2) The RSC will support the RSO when it is necessary for the RSO to assert authority. If the RSC has overruled the RSO, it will record the basis for its action in the minutes of the semi-annual meetings.

c. Review of ALARA Program

- (1) The RSC will encourage all users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.
- (2) The RSC will perform a semi-annual review of occupational radiation exposure. The principal purpose of this review is to assess trends in occupational exposures as an index of the ALARA program quality and to decide what action is warranted to reduce exposure levels.
- (3) The RSC will evaluate the institution's overall effort for maintaining exposures ALARA on an annual basis. This review will include the efforts of the RSO, authorized users, and workers as well as those of management.

II. RADIATION SAFETY COMMITTEE

Charge of the Committee:

1. Ensure that licensed material will be used safely. This includes review as necessary of training programs, equipment, facility, supplies, and procedures;
2. Ensure that licensed material is used in compliance with applicable regulations and the institutional license;
3. Ensure that the use of licensed material is consistent with the ALARA philosophy and program;
4. Identify program problems and solutions.

Responsibilities of the Committee:

1. Be familiar with all pertinent regulations, the license application, the license, and amendments.
2. Review the training and experience of the proposed authorized users, and the Radiation Safety Officer (RSO), to determine that their qualifications are sufficient to enable the individuals to perform their work safely and are in accordance with the regulations and the license.
3. Review all requests for authorization to use radioactive materials, and approve or deny use on the basis of safety, consistent with the limitations of the regulations, the license, and the ALARA philosophy.
4. Prescribe special conditions that will be required during a proposed method of use of radioactive material such as requirements for bioassays, physical examinations of users, and special monitoring procedures.
5. Establish a program to ensure that all persons whose duties may require them to work in, or frequent areas where radioactive materials are used are appropriately instructed.
6. Review the radiation safety program at least annually to determine that all activities are being conducted safely, in accordance with regulations and the conditions of the license, and consistent with the ALARA program and philosophy. The review must include an examination of records, reports from the RSO, results of Office of Radiological Control inspections, written safety procedures, and the adequacy of the management control system.
7. Recommend remedial action to correct any deficiencies identified in the radiation safety program.
8. Maintain written minutes of all Committee meetings, including members in attendance and members absent, discussion, actions, recommendations, decisions, and numerical results of all votes taken; and
9. Ensure that the radioactive materials license is amended, if required, prior to any changes in facilities, equipment, policies, procedures and personnel.

Administrative Information

1. The Committee shall meet at least quarterly and as often as necessary to conduct its business
2. Membership must include one authorized user from each area using radioisotopes, the RSO, and a representative of management who is neither an authorized user nor the RSO.

Management may appoint alternate members to participate in meetings in the case of absence of principal members and can appoint as adjunct members representatives from security, physical plant, and other departments. (Adjunct members will abstain from balloting on radiation safety technical questions such as Item 2 through 5 in the “Responsibilities” section above).

3. To establish a quorum, one-half of the Committee’s membership, including the RSO and the management representative, must be present.
4. The Committee shall report to the CUNY ASRC Executive Director.

III. RULES FOR SAFE USE OF RADIOACTIVE MATERIAL

1. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.
2. Wear disposable gloves at all times while handling radioactive materials, changing them frequently.
3. Either after each procedure or before leaving the area, monitor your hands for contamination in a low-background area with an appropriate radiation detector.
4. Do not eat, drink, smoke, or apply cosmetics in any area where radioactive material is stored or used.
5. Do not store food, drink, or personal items in areas where radioactive material is stored or used.
6. Dispose of radioactive waste only in designated, labeled, and properly shielded receptacles.
7. Never pipette by mouth.
8. Wipe-test radioactive material storage, preparation, and disposal areas monthly for contamination detection. If necessary, decontaminate or secure the area for decay.
9. Survey all areas where radioisotopes are used with an appropriate radiation detection survey meter after each use. If necessary, decontaminate or secure the area for decay as appropriate.
10. Confine radioactive solutions in shielded containers that are clearly labeled.
Radioisotope containers must be labeled with the isotope, the name of the compound, and the date and time of receipt or preparation. A log book must be used to record the preceding information and total prepared activity, specific activity as mCi/cc at a specified time, total volume prepared, total volume remaining, and any other appropriate information.
11. Always keep sources, waste, and other radioactive material in shielded containers.
12. Use a cart to move sources, waste, and other radioactive material to minimize exposure.

IV. GUIDANCE FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL

Written records will be maintained that identify the authorized user or lab, isotope, chemical form, activity, and supplier. The Radiation Safety Officer (RSO) must be notified of each order for radioactive materials to verify that the requested materials and quantities are authorized by the license for use by the requesting person, and that possession limits are not exceeded. A copy of the purchase order will be adequate for this purpose. Incoming shipments will be delivered directly to the ASRC mailroom by the vendor’s carrier, and picked up promptly by the recipient. If a prompt pick-up cannot be made, the RSO will accept shipment and notify user as soon as possible. Shipments can only be accepted during off-duty hours by special arrangement,

V. PROCEDURE FOR OPENING PACKAGES CONTAINING RADIOACTIVE MATERIAL

The following procedure for opening each package will be followed:

- a. Put on gloves to prevent hand contamination.
- b. Visually inspect the package for any sign of damage (e.g. wet or crushed). If damage is noted, stop the procedure and notify the Radiation Safety Officer (RSO).
- c. Open the package with the following precautionary steps:
 - (1) Remove the packing slip.
 - (2) Open the outer package following the supplier's instructions, if provided.
 - (3) Open the inner package and verify that the contents agree with the packing slip and the purchase order.
 - (4) Check the integrity of the final source container. Look for broken seals or vials, loss of liquid, condensation, or discoloration of the packing material.
 - (5) If anything is other than expected, stop and notify the RSO.
- d. If there is any reason to suspect contamination, wipe the external surface of the final source container and remove the wipe sample to a low-background area. Assay that wipe sample to determine if there is any removable radioactivity.
- e. Monitor the packaging material and the empty packages for contamination with a radiation detection survey meter before discarding.
 - (1) If contaminated, treat this material as radioactive waste.
 - (2) If not contaminated, remove or obliterate the radiation labels before discarding in in-house trash.
- f. Make a record of the receipt.

VI. RECORDS OF RADIOACTIVE MATERIAL USE

For each unit received from a supplier, make a record of the:

1. Radionuclide;
2. Generic name or its abbreviation or trade name;
3. Date of receipt;
4. Supplier;
5. Lot number or control number, if assigned;
6. Activity in millicuries or microcuries as recorded on the unit or packing slip and its associated time;
7. Date of use and date of disposal.

VII. PROCEDURE FOR AREA SURVETS

Survey Procedure

All radioactive working areas will be surveyed as appropriate with meters calibrated at least annually by an approved external calibration service vendor.

1. In laboratory areas where only small quantities of radioactive material are used (less than 200 microcuries at a time), survey weekly for contamination when radioisotopes are in continuous use, and after each use when the isotope is used infrequently. Surveys should be performed with survey meters and/or wipe tests as appropriate.
2. Working areas in each laboratory, as designated by the laboratory diagram should be wiped with a cotton swab, injection prep pad, or filter paper moistened with alcohol. Each wipe should be labeled to identify the area. The wipe sample assay procedure should be sufficiently sensitive to detect the presence of 200 dpm/100 cm² of removable contamination. You must use a radioactive source with a known amount of activity to convert sample measurements (usually in counts per minute or cpm) to disintegrations per minute or dpm.
3. Areas showing contamination levels or yielding wipes showing more than 2X background must be decontaminated. RSO must be notified if area cannot be decontaminated.

Records

1. Keep a record of dose rate and contamination survey results. It must include the following information:
 - a. The date, area surveyed, and equipment used.
 - b. The name or initials of the person who made the survey.
 - c. A drawing of the areas surveyed with measured radiation levels in mR/hr or contamination levels in dpm/100 cm², as appropriate.
 - e. Actions taken in the case of excessive radiation and/or contamination levels and follow-up survey information.
2. The RSO will review and initial the records periodically and also promptly in those cases in which background levels are exceeded.

VIII. PROCEDURE FOR LEAK-TESTING SEALED SOURCES

1. Make a list of all sources to be tested. This should include at least the isotope, the activity on a specified date, and the physical form.
2. If you will be testing sources stronger than a few millicuries, set out a survey meter, preferably with a speaker, so you can monitor your exposure rate.
3. Prepare a separate wipe sample for each source. A cotton swab, injection prep pad, or filter paper, is suitable. Number each wipe so you will know for which source it is to be used. Samples should be taken as follows:

- a. For small sealed sources, it may be easier to wipe the entire accessible surface area. Pay particular attention to seams and joints.
 - b. For larger sealed sources and devices, take the wipe near the radiation port and on the activating mechanism.
 - c. If you are testing radium sources at the same time you are testing other sources, they should also be checked for radon leakage. This can be done by submerging the source in a vial of fine-grained charcoal or cotton for a day. Then remove the source and analyze the absorbent sample as described below. A survey should be done to be sure the sources are adequately shielded during the leak-test period.
4. The samples will be analyzed as follows:
- a. Select an instrument that is sufficiently sensitive to detect 0.005 microcurie. For beta sources, a proportional flow counter, liquid scintillation counter, or thin-end-window GM survey meter may be appropriate. For gamma sources, a crystal with a ratemeter or scaler may be appropriate. Dose calibrators and gamma cameras used in nuclear medicine are not sufficiently sensitive.
 - b. To estimate the detection efficiency of the analyzer used to assay the wipe samples, assay a check source that has the same isotope as the sealed source and whose activity is certified by the supplier. If one is not available, it will be necessary to use a certified check source with a different isotope that has a similar spectrum. If calculations demonstrate that the instrument is not sufficiently sensitive to detect 0.005 microcurie, a different instrument must be used.
 - c. Assay the wipe sample. It must be in the same geometry relative to the detector as was the certified check source.
 - d. Record the wipe sample counts per minute. Then calculate and record the estimated activity in microcuries on the wipe sample.
 - e. Continue the same analysis procedure for all wipe samples.
 - f. If the wipe sample activity is 0.005 microcurie or greater, notify RSO. The source must be withdrawn from use to be repaired or discarded. If it is a source distributed under an NRC or Agreement State license, the BRC must be notified. (see Section 175.106 (K) of the New York City Health Code.)
 - g. Sign and date the list of sources, data and calculations.

IX. PERSONNEL EXTERNAL EXPOSURE MONITORING PROGRAM

1. The RSO will promptly review all exposure records to look for workers or groups of workers whose exposure is unexpectedly high or low and for reports which are missing or late. This procedure does not apply to back-up monitor records, for example, pocket ionization chambers, when the monitor of record is film or thermoluminescent dosimeter (TLD).
2. As necessary, all individuals who are occupationally exposed to ionizing radiation on a regular basis will be issued a film or TLD whole body monitor that will be processed by a contracted service vendor on a quarterly basis. This service will be provided by a dosimetry processor who holds current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Bureau of Standards for the type of radiation(s) monitored.

3. Other individuals who may be exposed to radiation on a brief, occasional basis such as security, personnel who deliver packages, secretarial personnel, etc. who do not work with radioactive materials will not normally be issued exposure monitors.

X. EMERGENCY PROCEDURES

NOTE: ALL INCIDENTS MUST BE REPORTED TO THE ENVIRONMENTAL HEALTH AND SAFETY OFFICER/RSO AT: 646-673-2897

IF YOU SHOULD NEED EMERGENCY ASSISTANCE AFTER HOURS OR ON WEEKENDS, PLEASE CALL THE PUBLIC SAFETY EMERGENCY HOT LINE (212-650-7777).

All laboratory personnel must read these procedures prior to commencing work.

A. MINOR SPILLS

1. Notify all other persons in the room.
2. Restrict number of persons in spill area.
3. Confine spill immediately.

Liquid Spills

- a. Wear rubber or plastic gloves.
- b. Drop absorbent paper on spill.

Dry Spills

- a. Wear rubber or plastic gloves.
- b. Place damp absorbent paper over spill. Take care not to spread contamination.
4. Report the spill to the Radiation Safety Officer (646-673-2897).
5. Decontaminate as necessary.
6. Permit no person to resume work in the area of spill until a survey has been made and confirmed safe by the Radiation Safety Officer.

B. MAJOR SPILLS

1. Notify persons not involved to vacate the room at once.
2. If a liquid spill, right the container (have hands protected with gloves).
3. If spill is on skin, flush thoroughly.
4. If spill is on clothing remove at once.
5. Turn off all fans or ventilation, if possible.
6. Leave the room.
7. Notify the Radiation Safety Officer immediately (646-673-2897).
8. Decontaminate personnel involved as per the Radiation Safety Officer instructions.
9. Decontaminate area as per the Radiation Safety Officer's instructions.
10. All persons involved must be monitored.
11. Permit no person to resume work in the lab until a survey has been made and confirmed safe by the Radiation Safety Officer.

C. RADIOACTIVE DUSTS, MISTS, FUMES, GASES, ETC.

1. Notify other persons to vacate room. Hold breath and close valve, turn off air-circulating devices, as time permits. Vacate room.
2. Close all doors - post area.
3. Notify the Radiation Safety Officer (646-673-2897).
4. Report suspected inhalations of radioactive material.
5. Decontaminate as instructed by the Radiation Safety Officer.
6. A safety survey of area must be made by RSO and confirmed safe before work can resumed.

D. INJURIES INVOLVING RADIATION HAZARDS

1. Wash minor wounds immediately, under running water, spreading edges of wound.
2. Report all radiation accidents/injuries to personnel to the Environmental Health & Safety Officer.
3. In the case of traumatic injury, contact Public Safety at 212-650-7777.

E. FIRES INVOLVING POSSIBLE RADIATION HAZARDS

1. Sound alarm.
2. Call Public Safety (212-650-7777 and report location.
3. Call the Environmental Health & Safety Officer/RSO (646-673-2897)).
4. Close all doors .
5. Extinguish the fire, if safely possible.
6. Decontamination may be necessary before work is resumed in the area.

Table to distinguish between major or minor spills.

Estimate the amount of radioactivity spilled. Spills above these millicurie amounts are considered major. Amounts below are considered minor:

<u>Radionuclide</u>	<u>Millicuries</u>
H-3	10
S-35	1
C-14	1
P-32	0.10
I-125	0.01

Personnel Decontamination. Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer. If the spill is on the skin, flush thoroughly with lukewarm water and wash with a mild soap. If contamination remains, induce perspiration by covering the area with plastic. Then wash the affected area again to remove any contamination that was released by perspiration.

XI. WASTE MANAGEMENT

A. Overview

There are three commonly used methods of waste disposal: disposal through the sanitary sewer; decay-in-storage (DIS); transfer to a burial site or back to the manufacturer. Nothing in these guidelines relieves the licensee from maintaining records of the disposal of licensed material.

B. General Guidance

1. All radioactivity labels must be defaced or removed from empty containers and packaging materials prior to disposal in in-house waste.
2. It is important to keep volume of waste to an absolute minimum. Remind employees that non-radioactive waste such as leftover reagents, boxes, and packing material should not be mixed with radioactive waste.
3. Occasionally monitor all procedures to ensure that radioactive waste is not created unnecessarily. Review all new procedures to ensure that waste is handled in a manner consistent with established procedures.
4. In all cases, consider the entire impact of various available disposal routes. Consider occupational and public exposure to radiation, other hazards associated with the material and routes of disposal (e.g. toxicity, carcinogenicity, pathogenicity, flammability).

C. Procedure for Disposal of Liquid and Gases

Liquids may be able to be disposed of by release to the sanitary sewer. This does not relieve licensees from complying with other regulations regarding to toxic or hazardous properties of these materials.

1. Applicable regulations for disposal in the sanitary sewer must be adhered to. Contact Material must be readily soluble in the water. There are daily and monthly limits based on the total sanitary sewerage release of our facility. Make a record of the date, radionuclide, estimated activity that was released (in microcuries), and of the sink at which the material was released.

D. Procedures for Disposal by Decay-in-Storage (DIS)

Short-lived material (physical half-life less than 90 days) will be disposed of by DIS. To use this procedure, radioactive material must be separated according to half-life.

1. When the container is full, seal it with tape and attach an identification label or tag that includes the date sealed, the longest-lived radioisotope in the container, and the name of the authorized user. The container will then be transferred to the DIS area by the RSO.
2. Material will be stored for at least 10 half-lives.
3. Prior to disposal as in-house waste, each container will be monitored as follows:
 - a. Check radiation detection survey meter for appropriate detector, sensitivity and proper operation;
 - b. Plan to monitor in a low-level (less than 0.05 millirem per hour) area;
 - c. Remove any shielding from around the container;

- d. Monitor all surfaces of each individual container;
- e. Discard as in-house waste only those containers that cannot be distinguished from background. Record the date on which the container was sealed, disposal date, type of material, and obtained measurements. Check to be sure all radiation labels have been obliterated.
- f. Containers that can be distinguished from background radiation level must be returned to the storage area for future decay or transferred for approved burial.

E. Disposal of Long-Lived Radioactive Waste

Long-lived material (physical half-life greater than 90 days) shall be stored separately in labeled containers pending eventual disposal at an approved disposal site through the Environmental Health & Safety Officer/RSO. The waste storage (room G-771) will be used for storing these materials. Attach an identification tag with your name, date stored, radioisotope in the container, and activity level. Contact the Radiation Safety Officer for transfer to the storage room.

Appendix A: Procedure for Sink Disposal of Liquid Radioactive Carbon-14 Waste into Sanitary Sewer.

I. OVERVIEW

This procedure describes the manner in which liquid radioactive waste will be stored and disposed at the CUNY ASRC by authorized user, after obtaining approval by the RSO. In order to ensure that drain disposal limits are not exceeded, radioactive liquid waste will be collected in an appropriate labeled container and stored in lab by the authorized user until proper disposal. Before disposing of radionuclides, laboratory personnel must make an accurate determination of activity and indicate that on the waste container label (see below). Authorized user must also comply with other applicable hazardous waste regulations.

Authorized user may discharge licensed material into sanitary sewerage if each of the following conditions is satisfied:

- The material is readily soluble in water or is biological material that is readily dispersible in water; and
- **The quantity of Carbon-14 released into the sewer in 1 month divided by the average monthly volume of water released into the sewer by licensed facility does not exceed a concentration of 3×10^{-4} microcurie/ml (uCi/ml);** and
- If more than one radionuclide is released, the following conditions must also be satisfied:
 - The licensee shall determine the fraction of the limit into sanitary sewer by dividing the actual monthly average concentration of each radionuclide released into the sewer by the allowable concentration of that radionuclide listed in applicable regulation; and
 - The sum of the fractions for each radionuclide will not exceed unity; and
- **The total quantity of licensed radioactive material released into the sanitary sewerage in a year must not exceed 37 GBq (1 Ci) of all radioactive materials combined.**

II. EQUIPMENT

- Pipette & tips
- Liquid waste container
- Liquid scintillation vials (LSC vial)
- Liquid scintillation cocktail
- Liquid scintillation counter (LSC)
- Lab Coat, gloves and eye protection
- Drain disposal record form

III. PRECAUTIONS

- Only water soluble liquids may be disposed of down the drain.
- Wear protective clothing, gloves, and eye wear when handling radioactive material.
- Only a sink authorized and designated as “hot” sink by the RSO can be used for drain disposal. The sink area will be labeled with “radioactive material” tape or labels.
- All containers exposed to or actively used for radioactive material storage must be clearly labeled with “radioactive material” tape or labels.
- Containers with radioactive material present must include a log sheet for recording additions to the container and so all may see the quantity present.

IV. PROCEDURE

Estimation of radioactivity prior to drain disposal

- Sampling and counting radioactive liquids
 - Collect and record the volume of radioactive liquid in a suitable container.
 - Aliquot one milliliter (ml), or other appropriate volume of liquid and pipette into an LSC vial.
 - Fill vial with cocktail suitable for liquid sample counting.
 - Place vial into LSC
 - Determine counts per minute (cpm) from the LSC results
- Calculate total activity
 - Convert cpm to disintegrations per minute (dpm) using the efficiency of the LSC and the following equation:

$$\text{dpm} = \text{cpm} / \text{efficiency}$$

Note: Efficiency will vary depending on the LSC, radionuclide, and instrument settings. Contact LSC maintenance vendor for details.

- Calculate total activity by multiplying dpm/ml by total volume then convert to μCi :

$$\text{dpm} / \text{aliquot volume} \times \text{total volume} = \text{total dpm}$$

$$\mu\text{Ci} = \text{total dpm} / 2.22 \times 10^6 \text{ dpm}/\mu\text{Ci}$$

- Check sink disposal limits written on the laboratory drain disposal log sheet (posted at the “hot” sink). On the drain disposal log sheet record the date activity disposed, radionuclide, and initials. Dispose of the liquid accordingly.
- Example:
 - 500 ml of radioactive liquid ^{32}P was collected over several weeks of experiments.
 - One ml has been pipetted into an LSC vial. The vial has been filled with cocktail and loaded into an LSC. The resulting counts are 75,000 cpm.
 - Convert cpm to dpm:
 $75,000 \text{ cpm} / 95\% \text{ (Efficiency of counter for } ^{32}\text{P)} / \text{aliquot volume}$
 $75,000 / 0.95 = 78,947 \text{ dpm/ml}$
 $78,947 \text{ dpm/ml} \times 500 \text{ ml} = 3.95 \times 10^7 \text{ dpm total}$
 - Convert dpm to μCi :
 $3.95 \times 10^7 \text{ dpm} / 2.22 \times 10^6 \text{ dpm}/\mu\text{Ci} = 17.79 \mu\text{Ci}$

Drain Disposal by “Averaging Method”

1. Perform above procedure at least 3 times on same protocol. The same initial activity must be used each time.
2. When similar values are obtained for these LSC readings, take the average of the calculated activity.
3. Use this value for subsequent drain disposals for that protocol.
4. This value should be updated when the protocol changes.
5. This average should also be updated approximately every 3 years.

Note: All documentation for drain disposals must be retained until the NYC DOH authorizes disposition. Drain disposal procedure and records will be monitored and inspected monthly by the RSO.

Appendix B: Guidelines for Radioactive Materials Use

The function of the Radiation Safety Committee is to support the safe usage of radioactive materials for research. In addition to the procedures contained in the CUNY ASRC Radiation Safety Plan, the Radiation Safety Committee has adopted the following guideline in order to clarify several important issues regarding the use of radioactive materials:

- 1) Ordering and Receiving Radioisotopes
- 2) Students Access to Radioactive Materials
- 3) Emergency Response Protocol

1. ORDERING AND RECEIVING RADIOISOTOPES

In accordance with applicable regulations, the ASRC is licensed by the NYC Dept. of Health to maintain a limited amount of listed radioisotopes at any given time in specified locations.. All researchers who are planning to use radioactive materials must obtain prior authorization from the Radiation Safety Committee. Application forms are available from the Radiation Safety Officer (RSO). Once the committee reviews and approves the application, the RSO will forward it to the NYC Dept. of Health and request the addition of the Principal Investigator (PI) as an authorized user on the license.

Each authorized PI is responsible for adherence to applicable safety regulations and procedures governing the use, storage, and disposal of radioisotopes.

- All radioactive materials must be delivered to:

CUNY Advanced Science Research Center (ASRC)
85 St. Nicholas Terrace, New York, NY 10031
Attention: [Name of Authorized User & Room Location]

- Once package is delivered, the Mail Room will contact the respective PI or his/her designee (post doc, graduate student, etc.) for pick-up of package. Secretarial staff or undergraduate and high school students are not permitted to pick up these deliveries. Also, delivery of radioactive materials to administrative offices is not permitted. This is necessary in order to make sure that package is intact upon receipt in accordance with regulatory requirements.
- Package must be visually inspected and tested with a survey meter upon receipt. Inspection results must be entered on record form (See copy in Appendix C).
- A copy of the packing slip must be sent to the RSO.
- Maintain up-to-date records of isotope inventory, usage, clean up, surveys, and emergencies (if any). The record form (See copy in Appendix D) must be kept up to date and made available to the RSO or NYC Dept. of Health during inspection.
- Secure radioactive materials (before, during, and after use) from unauthorized removal or access, such as inside a locked room, freezer, refrigerator or cabinet.
- Physical inventories will be conducted at intervals not to exceed 6 months, to account for all sealed sources and devices received and possessed under the license.

2. STUDENT ACCESS TO RADIOACTIVE MATERIALS

- The PI is responsible for supervising and providing instruction on safe laboratory practices and techniques to personnel and/or students under his/her direction and supervision. High school students or minors (<18 years of age) are not permitted to handle radioisotopes and may not be in the designated work area of the laboratory while radioactive materials are in “active” use (outside of their original container, waste containers, or shielding). Undergraduate students may only handle radioisotopes under the direct supervision of an appropriate authorized faculty member, or trained doctoral fellow.
- Radiation safety training is available annually from the CUNY- Central Office of Environmental Health, Safety, and Risk Management (EHSRM) and on an as-needed basis from the Radiation Safety Officer. Each authorized PI must provide the names of all individuals who will be using radioactive material(s) to the RSO and ensure that each designated user receives adequate training.
- In case of a pregnant employee or student, exposure to the fetus must be kept below 0.05 rem for each month, and 0.5. rem for the entire gestation period. It is the responsibility of the pregnant person to notify the authorized user (PI) and follow the necessary precautions. The PI will work with the RSO to determine what changes in procedures or controls will be required to assure that necessary precautions are taken by the pregnant person.

3. EMERGENCY RESPONSE PROTOCOL

- Actions to be taken in the event of a spill or other emergency must be evaluated both with respect to maintaining safety and permitting continuation of research activities. In the event of a spill or other emergency involving radioisotopes, an authorized user (preferably) or a witness to the emergency must contact the RSO as soon as possible, even if the spill is minor and has been cleaned up. The RSO will check the laboratory and ascertain whether the spill area was properly decontaminated. If such a situation occurs at a time when the RSO is not on campus, and immediate assistance is needed, the authorized user should contact the RSO at the emergency contact phone # posted in the laboratory.
- If immediate assistance is not needed, an authorized user must promptly report the incident to the RSO the next business day. Safety concerns of other individuals (e.g. students, other faculty, staff, etc.) are also to be directed to the attention of the RSO, whose responsibility is to gather information, evaluate the situation, and advise individuals in the laboratory or administration as necessary.

Appendix C: Incoming Radioactive Material Package Survey Form

CUNY ASRC Environmental
Health and Safety

INCOMING RADIOACTIVE MATERIAL PACKAGE SURVEY FORM

Package Id/ Isotope/ Amount	Any Damage To Package? (Y/N)	Dose Rate reading at 1 meter and surface (mR/h)	Wipe Test (dpm/100cm ²)	Instrument(s) Used

Survey Performed By: _____ Date: _____

Appendix D: Record of Radioactive Material Use Form

CUNY ASRC Environmental Health & Safety
RECORD OF RADIOACTIVE MATERIAL USE

Authorized User _____ Purpose of Use _____
 Laboratory _____ Room _____ Contact _____

Source Procurement:

Final Disposal (if not all used):

Material Isotope	Chemical Form	Date Received	Amount Received	Date of Use	Amount Used	Balance Remaining	Amount Disposed	Date of Disposal	Manner of Disposal

Manner of Disposal – Sink, DIS (Decay in Storage), RSO, Other (specify).
 To arrange for disposal of Radioactive Waste, contact RSO at 646-673-2897.