

ARIZONA RADIATION REGULATORY AGENCY
APPLICATION FOR RADIOACTIVE MATERIALS LICENSE
LABORATORY-INDUSTRIAL

INSTRUCTIONS: Complete all items in this application for new license or the renewal of an existing license. Use supplemental sheets where necessary. Item 23 must be completed on all applications. Prepare two copies of this application and all supplemental sheets. Mail the original to: Arizona Radiation Regulatory Agency, 4814 South 40th Street, Phoenix, Arizona 85040. Upon approval of this application, the applicant will receive an Arizona Radioactive Materials License.

1a. **NAME AND MAILING ADDRESS OF APPLICANT**
(Institution, Firm, Individual Owner, etc.) Include zip code

1b. **STREET ADDRESS(S) AT WHICH RADIOACTIVE MATERIAL WILL BE USED** (If different than 1a.) Include Zip Code

2. **PERSON TO CONTACT REGARDING THIS APPLICATION:**

TELEPHONE NO:

3. **THIS IS AN APPLICATION FOR:** (Check appropriate item)

A. ' NEW LICENSE* B. ' AMENDMENT TO LICENSE NO. _____ C. ' RENEWAL OF LICENSE NO. _____

4a. **INDIVIDUAL USERS** (Name of individuals who will use of directly supervise use of Radioactive Material)

4b. **TRAINING AND EXPERIENCE** (Check one or more)

' Attachment "A" completed and attached for RSO and each user.

' Training previously filed under License No. _____

5a. **RADIATION SAFETY OFFICER (RSO)** (Name of person designated as Radiation Safety Officer)

5b. **DUTIES OF RADIATION SAFETY OFFICER** (Check one)

' Attachment B Duties Attached ; or

' Equivalent Duties attached

6. **RADIOACTIVE MATERIAL**
(Elements and mass number of each)

A. _____

B. _____

C. _____

7. **CHEMICAL AND/OR PHYSICAL FORM OR SEALED SOURCE MANUFACTURER AND MODEL NUMBER**

A. _____

B. _____

C. _____

8. **MAXIMUM QUANTITY OF EACH CHEMICAL OR ACTIVITY OF EACH SOURCE**

A. _____

B. _____

C. _____

9. **DEVICE AND USE DESCRIPTION** (Make lettering correspond to lettering in items 6, 7 and 8 above)

A.

B.

C.

D.

10. **RADIATION DETECTION INSTRUMENTS** (list radiation detection instruments used in your radiation safety program)

MANUFACTURER	MODEL	DETECTS WINDOW THICKNESS		TYPE OF USE
		RANGE	(CTS/min or mR/Hr)	
_____	_____	_____	(mg/square cm)	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

11. **CALIBRATION OF DETECTION INSTRUMENTS**

(Mandatory for all instruments possessed) (check one)

- ' No survey instruments possessed.
- ' Calibration will be done at intervals not to exceed 12 months and after each repair.
- ' Calibration will be done at intervals not to exceed 6 months and after each repair.
- ' Applicant will do instrument calibrations.
- ' Attachment C procedures will be followed and are attached; or
- ' Equivalent procedures are attached.
- ' Calibration will be done by:
Name: _____
Address: _____
License No.: _____

12. **PERSONNEL MONITORING** (check as appropriate)

- ' No personnel monitoring necessary, justification attached.
- ' Personnel monitoring required.

Whole body	Extremity
' TLD	' TLD
' Film	' Film

(RADIATION TYPE)
' Beta-Gamma ' Beta-Gamma-Neutron
(FREQUENCY OF EXCHANGE)
' Monthly ' Quarterly

Name and address of Dosimetry supplier
Name: _____
Address: _____

13. **BIOASSAY PROGRAM** (check one)

- ' Bioassay program not needed, justification attached; or
- ' Detailed bioassay program attached.

14. **FACILITIES**

- ' Facilities and storage diagram attached.

15. **SURVEY PROGRAM**

- ' Attachment "D" procedures signed and attached; or
- ' Equivalent survey criteria and procedures attached.

16. **LEAK TEST PROGRAM** (check one)

- ' Applicant will contract with approved outside consultant to do leak test.
Name: _____
Address: _____
- ' Applicant will do leak tests using approved leak test kit, mailing kit to manufacturer for counting.
Name: _____
Address: _____

17. **RECORDS MANAGEMENT PROGRAM**

- ' Attachment "E" completed and attached.
- ' Sample of each record form attached.

18. **INSTRUCTIONS TO PERSONNEL**

- ' Attachment "F" completed and attached; or
- ' Equivalent training program attached.
- ' Attachment "G" completed and attached; or
- ' Equivalent safety rules attached.

19. **WAST DISPOSAL**

- ' Attachment "H" completed and attached; or
- ' Equivalent procedures attached.

20. **EMERGENCY PROCEDURES**

- ' Attachment "I" completed and attached; or
- ' Equivalent procedures attached.

21. **ORDERING AND RECEIVING PACKAGES**

- ' Attachment "J" completed and attached; or
- ' Equivalent procedures attached.

22. **OPENING PACKAGES**

- ' Attachment "K" completed and attached; or
- ' Equivalent procedures attached.

23. **ANIMAL USE**

- ' Not applicable.
- ' Detailed radiation safety procedures attached.
(including waste disposal)

24. **ANNUAL LICENSE FEE REQUIRED**

- (See AAC Title 12, Chapter 1, Article 13)
- ' License fee category: **Laboratory - Industrial**
- ' License fee enclose: \$ _____

25. **LETTER TO LOCAL GOVERNING AUTHORITY**

(See AAC R12-1-309.5)

26. **ALARA PROGRAM**

- ' ALARA program will be initiated in accordance with R12-1-407.

27. **BUSINESS STRUCTURE**

- ' Attachment "L" describes legal structure of applicant.

ITEM 28-CERTIFICATION
(This item must be completed by applicant)

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH ARIZONA ADMINISTRATIVE CODE, TITLE 12, CHAPTER 1, AND THAT ALL INFORMATION, INCLUDING ANY SUPPLEMENTS OR ATTACHMENTS ARE TRUE AND CORRECT TO THE BEST OF THE APPLICANT'S KNOWLEDGE AND BELIEF.

(Type or Print name of Certifying Official) BY: _____ (Signature)

(Title of Certifying Official) DATE: _____

ARIZONA RADIATION REGULATORY AGENCY

**GUIDE FOR THE PREPARATION OF APPLICATIONS FOR LICENSES
FOR LABORATORY USE OF SMALL
QUANTITIES OF RADIOACTIVE MATERIALS****I. PURPOSE OF GUIDE**

This guide describes the type of information needed by the ARRA staff to evaluate an application for a specific license for laboratories and industries using millicurie quantities of radioactive material. Attachments A through L to this guide are provided to describe model duties and procedures. Each applicant should carefully read the applicable rules and model duties and procedures and then decide if the models are appropriate for its specific radiation safety needs. In the application, applicants may certify that they will follow a model procedure or may develop their own procedure and enclose it for review.

II. FILING AN APPLICATION

An application for a license is made by completing Form ARRA-L. Some items may be completed on the form itself. If additional room is required, an additional sheet may be added. For any supplementary pages, identify and key each separate sheet or document submitted with the application to the item number on the application to which it refers.

All items should be completed in enough detail to allow the Agency to determine that the equipment, facilities, training and experience, and radiation safety program are adequate to protect health and minimize danger to life and property.

As all license applications are available for review by the general public, do not submit proprietary information or personal information about individual employees unless it is necessary. For example, the training and experience of individuals should be submitted to demonstrate their ability to manage radiation safety programs or to work safely with radioactive material. Home addresses and home telephone numbers should be submitted only if they are a part of an emergency response plan. Dates of birth, Social Security numbers, and radiation dose information should be submitted only if specifically requested by the Agency. If submittal of proprietary information is necessary, the applicant may request that such information be handled as such and kept from public dissemination.

The application should be filed to the address shown in Section III of this guide. The applicant should retain a copy as the applicant will be required to possess and use licensed material in accordance with the statements and representations made in the application and any supplements to it.

III. CONTENTS OF AN APPLICATION

This portion of the guide explains, item by item, the information requested on Form ARRA-L. The attachments to this guide serve several different purposes, i.e., to provide additional information on certain subject areas, to provide a model procedure the licensee may adopt in response to an item on the application form, or to provide an outline the applicant may use to develop a procedure for review by the Agency staff.

If after careful review of this guide, applicants have specific questions, they should contact the Radioactive Materials Program staff at:

Arizona Radiation Regulatory Agency
Radioactive Material Program
4814 S. 40th Street
Phoenix, Arizona 85040
(602) 255-4845 (233)
(Fax) 437-0705

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Item 1a. Name and Mailing Address of Applicant.

Enter the name, mailing address and telephone number of the applicant. Specify the applicant, corporation or other legal entity by name. Individuals should be identified as the applicant only in acting in a private capacity and the use of radioactive material is not connected with their employment for a corporation or other legal entity.

Item 1b. Street Address at which Radioactive Material will be used.

List the addresses and locations where radioactive material will be used. If multiple addresses are to be used, explain the extent of use at each address and the facilities and equipment located at each place of use. The actual locations of use should be listed, whether or not they are the same as the mailing address in Item 1a.; e.g., a P.O. Box may be most suitable for Item 1a. in some cases, but a P.O. Box does not adequately describe the location of use. Item 1b. must be an in-state address. Field locations should be specified as "temporary job sites throughout the state of Arizona".

Item 2. Person to Contact.

Enter the name and telephone number (including area code) of the individual to be contacted. This individual should be familiar with the proposed radioactive materials program and be able to answer questions about the application. This individual will serve as the point of contact during the review of the application and during the period of the license, and is authorized to act on behalf of the applicant.

Item 3. Type of Application.

Indicate whether this is an application for a new license, an amendment, or a renewal. If this application is for a new license, the appropriate license fee must accompany the application in order for the review to begin (complete Item 24).

Item 4a. Individual Users.

List the names of all persons who will use, supervise, or direct the use of radioactive material. This list should include the individuals who supervise other individuals in training. An authorized user must be present and directly supervise usage of radioactive material at temporary job sites.

Item 4b. Training and Experience.

Complete Attachment A for the Radiation Safety Officer and each authorized user, unless this information has been previously submitted as part of a license application. Designate which license the information was filed under. The qualifications, training, and experience of each person should be commensurate with the material and its use as proposed in the application. The amount and type of training and experience with radiation and radioactive materials required to support a determination of adequacy by the Agency will vary marked with certain factors.

If other persons such as technical assistants and laboratory workers will use radioactive materials in the absence of persons specified above, the specification of the training of such personnel should include (a.) instruction in radiation safety including topics covered and by whom taught, (b.) on-the-job training in use of radioactive materials, and (c.) determination of competency to work with the presence of supervisory personnel.

The use of microcurie quantities of nonvolatile radioactive materials by a person with a minimum of training and experience under controlled conditions may be justified provided it is done under the surveillance of a radiation safety officer. Such minimum training and experience may consist of a few hours of training and experience in the use of one or more radioactive materials similar to the use proposed in the application under the supervision and tutorship of a licensed user.

Persons using millicurie quantities of a number of radionuclides for general laboratory tracer work under unspecified

conditions should have more extensive training and experience and, depending on the exact nature of the proposed program of use of radionuclides, may need to have completed formal course work at the college or university level covering the areas listed in Attachment A.

The use of larger quantities of material (approaching a Curie) under conditions where a potential exists for significant loss and ingestion, inhalation, or absorption of the radioactive material by those working with the material is normally done under carefully controlled conditions using specialized equipment. A person who is to use radioactive materials independently under these conditions should not only have a background of formal training in all areas described in Attachment A but should also have extensive experience working with radioactive material and a thorough working knowledge of the equipment required to handle the material safely.

Item 5a. Radiation Safety Officer.

Specify the name of the person who will be designated as the Radiation Safety Officer (RSO). This person will be responsible for implementing the radiation safety program and must therefore be readily available to the users in case of difficulty. He must be trained and experienced in radiation protection and in the use and handling of radioactive materials. In a small program not requiring a full-time RSO, the duties of the RSO may be assigned to one of the persons named under Item 4a. above. Note, however, that it must be established that the person acting as RSO will have the opportunity to devote sufficient time to the radiation safety aspects of the program for the use of radioactive materials.

Item 5b. Duties of the Radiation Safety Officer.

If the model duties listed on Attachment B will be used, sign, date and include Attachment B with the application. If equivalent duties will be established, include them with the application. In either case, mark the appropriate box in Item 5b.

Items 6, 7, and 8. Radioactive Material Description.

Describe the radioactive material by isotope, chemical and/or physical form and activity in millicuries or microcuries. A separate possession limit for each nuclide must be specified. Limits requested must cover the total anticipated inventory, including stored materials and waste, and should be commensurate with the applicant's needs and facilities for safety handling.

If the use of sealed or plated sources is contemplated, the isotope, manufacturer, and model number of each sealed or plated source must be specified.

Item 9. Device and/or Use Description.

If a source will be used in a gas chromatograph, gauge, or other device, the manufacturer and model number of the device must be specified. In any case, the use to be made of the radioactive material must be clearly described.

Sufficient detail must be given to allow a determination of the potential for exposure to radiation and radioactive materials, both of those working with the materials of the public.

Item 10. Radiation Detection Instruments.

Specify for each radiation detection instrument used in the radiation safety program the manufacturer's name and model number, the number of each type of instrument available, the type of radiation detected (alpha, beta, gamma, or neutron), the sensitivity range (milliroentgens per hour or counts per minute), the window thickness in mg/cm, and the type of use. The type of use would normally be monitoring, surveying, assaying, or measuring.

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Item 11. Calibration of Detection Instruments.

Some programs are so small that survey instruments are not required. This is particularly true where only low energy beta isotopes are used. If the applicant does not need and does not plan to procure a radiation survey instrument, mark the box labeled "No survey instruments possessed".

All radiation detection instruments possessed must be calibrated. Designate the frequency of calibration. Designate whether the applicant will do instrument calibration, or whether applicant will contract with approved service agency for instrument calibration. Attachment C is provided for the convenience of the applicant as acceptable procedures for calibrating dose rate instruments. The applicant may sign, date and submit Attachment C or equivalent procedures for the calibration of dose rate instruments.

Other instrument system requiring calibration should meet the following criteria:

- A. Describe the instrument calibration methods and procedures for the calibration of contamination monitoring instruments, as well as any other instruments and systems used in the radiation safety program, such as measuring instruments used to assay sealed-source leak-test samples (see Item 16), contamination samples (e.g., air samples, surface "wipe" samples), and bioassay samples (see Item 13).
- B. An adequate calibration of instruments usually cannot be performed with built-in check sources. Such check sources are, however, ideal for instrument standardization. Electronic calibrations do not involve a source of radiation and are not adequate to determine the proper functioning and response of all components of an instrument.
- C. Description of calibration procedures must include, as a minimum:
 1. The name of the manufacturer and model number of each of the standards used,
 2. The nuclide and quantity of radioactive material contained in each of the standard sources,
 3. A statement of the accuracy of each of the standard sources. The source accuracy should be, as a minimum, +/- 5% of the stated value and traceable to a primary standard, such as that maintained by the NIST.
 4. Step-by-step calibration procedures and, if appropriate, associated radiation safety procedures, and
 5. The name and pertinent experience of each person who will perform the instrument calibrations.

Item 12. Personnel Monitoring.

AAC R12-1-419 specifies when personnel monitoring is required. If film badge or thermoluminescent dosimeters (TLD) will be used, specify the name of the organization furnishing the dosimetry service and the frequency for changing badges, dosimeters, ect.

If personnel dosimetry will not be used, submit calculations or documentation from radiation surveys demonstrating that it is unlikely that any individual will receive a dose equal to or greater than that indicated in AAC R12-1-419.

Item 13. Bioassay Program.

Show that the need for bioassay has been thoroughly considered and establish the adequacy of the proposed bioassay

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program in relation to the proposed program of use of radioactive material. Consult Arizona Radiation Regulatory Agency Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations, and Assumption for a Bioassay Program" and/or Regulatory Guide 8.20, "Bioassay Program Criteria for I-125 and I-131" for further guidance in establishing a bioassay program.

Specify and describe in detail the criteria to be used in determining the need for bioassay, the type and frequency of bioassay service is to be used.

Bioassay may not be substituted for other elements of a safety program such as air monitoring and dispersion control (hoods, glove boxes, ect.) And for well-thought-out and well-executed handling procedures.

Item 14. Facilities.

Attach to the application a diagram and description of the facilities, storage areas, and equipment. If there is more than one location of use, describe in detail the facilities and equipment for each site. The proposed facilities and equipment should be adequate to protect the health of the public as well as the users. In describing available facilities and equipment, include the following as appropriate:

- A. Physical plant, laboratory, or working area facilities. Describe fume hoods, glove boxes, waste receptacles, special sinks, ventilation and containment systems, effluent filter system, and all processing, work, and protective clothing change areas.

Submit a drawing or sketch showing the location of all such equipment and the relationship to areas where radioactive material will be handled to unrestricted areas where radioactive materials will not be handled. In those programs where radioactive material may become airborne or may be included in airborne effluents, include a schematic description of the ventilation system in the drawing or sketch annotated to show airflow rates, differential pressures, filtration and other effluent treatment equipment and air and effluent monitoring instruments. Make the drawings or sketches to scale and include the dimensions on each drawing or sketch. Label each drawing or sketch to specify the location of each facilities and equipment depicted with respect to the address given in Item 1b. of Form ARRA-L.

- B. Containers, devices, protective clothing, auxiliary shielding, general laboratory equipment, air sampling equipment, etc., actually employed in the daily use of material. Describe special provisions for shielding and containment to minimize personnel exposure. Storage containers and facilities should provide both shielding and security for materials.
- C. The number, type and length of remote handling devices.
- D. Follow the provisions of AAC R12-1-410 and R12-1-425 and submit appropriate information if respiratory protection equipment will be used to limit the inhalation of airborne radioactive material.

Item 15. Survey Program.

AAC R12-1-418 requires that surveys be performed as necessary to establish compliance the rules pertaining to the use of ionizing radiation and to evaluate the extent of radiation hazards that may be present. Surveys should include the evaluation of external exposure to personnel, concentrations of airborne radioactive material in the facility, and radioactive effluents from the facility. Although a theoretical calculation is often used to demonstrate compliance with rules regarding airborne or external radiation, it cannot always be used in lieu of a physical survey.

Except for those cases where sources of radiation and radioactive material are well known and accurately and precisely controlled, it will usually be necessary that a physical survey be made with appropriate detection and measurement

instruments to determine the nature and extent of radiation and radioactive material or, as a minimum, confirm the results of a theoretical determination.

Attachment D of this guide is included as a model survey program which may be used by the licensee. If this model program will be used, the licensee should sign, date and submit the model program as part of the application package. Check the appropriate box under Item 15.

If the model program will not be used, the licensee must submit an equivalent survey program addressing the items covered in Attachment D.

For operations involving radioactive materials in gas, liquid, or finely divided forms, the survey program must also include monitoring the adequacy of containment and control of the materials involved. The program must include air sampling, monitoring of effluents, and surveys to evaluate contamination of personnel, facilities, and equipment. Physical effluent measurements are essential to determine compliance with AAC R12-1-425 and 436. A description of the survey program must be attached in addition to the procedures listed in Attachment D or its equivalent.

The description of an air sampling program must include the area where samples will be taken, the frequency of sampling, and the location of the sampler with respect to a worker's breathing zone. Assays performed to evaluate air samples and the methods used to relate results to actual personnel exposures must also be described.

The effluent monitoring program for releases to unrestricted areas should encompass all airborne and liquid radioactive material releases. Theoretical evaluations should be supplemented by stack monitoring, water sampling, and other environmental monitoring appropriate for the planned and potential releases.

Item 16. Leak Test Program.

Sealed sources containing more than 100 microcuries of a beta or gamma emitter or more than 10 microcuries of an alpha emitter must be leak tested as required in AAC R12-1-417. If a commercial firm is to perform the leak tests, the name, address, and license number of the firm should be submitted. If the tests are to be performed using a commercial "kit", the name of the manufacturer or distributor and processor of the kit should be given. If the applicant intends to perform his own leak tests without the use of a commercial kit, the following information must be provided:

- A. Qualifications of personnel who will be perform the leak test,
- B. Procedures and materials to be used in taking the test samples,
- C. The type, manufacturer's name, model number, and radiation detection and measurement characteristics of the instrument to be used for assay of test samples,
- D. Instrument, calibration procedures, including calibration source characteristics, make, and model number, and
- E. The method, including sample calculation, to be used to convert instrument of activity, e.g., microcuries.

In all cases, mark the appropriate box listed under Item 16 of Form ARRA-L.

Item 17. Records Management Program.

Complete and attach Attachment E (which defines required records for laboratory use of small quantities of radioactive material). Attach to the application a sample of each record form used in the radiation program.

Item 18. Instructions to Personnel.

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Attachments F and G are provided as model programs which can be followed by the licensee in establishing an acceptable training program for radiological and non-radiological workers. If the licensee will use Attachment F and G Sign, date and submit the appendices with the application. If Attachments F and G will not be used, the licensee must submit equivalent materials covering a minimum of those items which are listed in the model programs in Attachments F and G. In both cases, mark the appropriate boxes for Item 18 on the application.

Item 19. Waste Disposal.

Attachment H is provided as a model program for the licensee to use in establishing an adequate radioactive waste disposal program. If the licensee will utilize Attachment H, sign, date and attach Attachment H to the application. If Attachment H will not be utilized, equivalent procedures must be attached. Under Agency rules, a licensee may only dispose of waste as outlined in AAC R12-1-434. Check the appropriate box under Item 19 of Form ARRA-L.

Item 20. Emergency Procedures.

Attachment I is included as a model procedure to be used in establishing acceptable emergency procedures. If the licensee will utilize Attachment I, sign, date and include Attachment I with the application. If Attachment I will not be utilized, equivalent procedures must be submitted utilizing Attachment I as a guide for the type of information required. In either case, check the appropriate box under Item 20 of Form ARRA-L.

Item 21. Ordering and Receiving Packages.

Attachment J is included as a model procedure to be used in establishing acceptable procedures for ordering and receiving packages. If Attachment J will be utilized, sign, date and attach Attachment J to the application. If Attachment J will not be utilized, equivalent procedures must be submitted utilizing Attachment J and AAC R12-1-433. IN either case, check the appropriate box under Item 21 of Form ARRA-L.

Item 22. Opening Packages.

Attachment K is included as a model procedure to be used in establishing acceptable procedures for opening packages. If Attachment K will be utilized, sign, date and attach Attachment K to the application. If Attachment K will not be utilized, equivalent procedures must be submitted utilizing Attachment K and AAC R12-1-433. In either case, check the appropriate box under Item 22 of Form ARRA-L.

Item 23. Animal Use.

If no animal use is planned, check the "Not Applicable" box under Item 23 of Form ARRA-L. If animal use is anticipated or planned, submit detailed radiation procedures (including waste disposal) as an attachment to the license application.

Item 24. Annual License Fee Required.

If this a request for a new license, the appropriate license fee must accompany the application before review of the application can begin. Consult AAC R12-1-1306 for determining the license fee category and appropriate fee. All checks should be made out to the Arizona Radiation Regulatory Agency.

Item 25. Letter to Local Governing Authority.

AAC R12-1-1309(5) requires that all applicants for a radioactive materials license demonstrate that a letter has been sent, return receipt requested, to the mayor's office of the city, town, or if not within an incorporated community, to the County Board of Supervisors in which the applicant proposed to operate which describes the nature of the proposed

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activity involving radioactive materials and the facility, including use and storage areas. A copy of this letter must be included in the application package.

Item 26. ALARA Program.

An ALARA Program in conjunction with an annual review of the Radiation Safety Program are required in AAC R12-1-407. Mark the box and attach to the application a description of the proposed annual review and how exposure to radiation will be kept as low as reasonably achievable (ALARA).

Item 27 Business Structure

Attachment L contains detailed questions concerning the structure of your business. Fill in the form with responses that best describes the ownership/management of the operation.

Item 28. Certification.

Item 27 must be completed. The form must be dated and signed by the corporate management (not the Radiation Safety Officer unless the management has filed with the Agency a statement authorizing the RSO to sign all applications and radiation safety program commitments).

IV. AMENDMENTS TO LICENSES

Licensees are required to conduct their programs in accordance with statements, representations, and procedures contained in the license application and supporting documents. The license must therefore be amended if the licensee plans to make changes in the facilities, equipment (including types of monitoring and survey instruments), procedures, authorized users or radiation safety officer, or radioactive material to be used.

Applications for license amendments may be filed on the application form or in letter form. The application should identify the license by license number. References to previously submitted information and documents should be clear and specific and should identify the pertinent information by date, page and paragraph. Amendment applications for amendment should be signed and dated by a representative of the licensee's administrative management. An original and one copy of the application for the amendment should be prepared. The original should be submitted, as in the case for new or renewal applications.

Retain the copy of the application, with all attachments, because the license will require, as a condition, the statements and representations set forth in the application and any supplement to it be followed. Mail the original to:

Arizona Radiation Regulatory Agency
Radioactive Materials Program
4814 S. 40th Street
Phoenix, Arizona 85040
(602) 255-4845 (233)
(Fax) 437-0705

ATTACHMENT A

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER
 (Use Supplemental Sheets if Necessary)

1. NAME

2. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	FORMAL COURSE	ON THE JOB
A. Principles and practices of radiation protection			YES NO	YES NO
B. Radioactivity measurement standardization And monitoring techniques and instruments			YES NO	YES NO
C. Mathematics and calculations basic to the use and measurement of radioactivity			YES NO	YES NO
D. Biological effects of radiation			YES NO	YES NO

3. EXPERIENCE WITH RADIATION (Actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

ATTACHMENT B

DUTIES OF THE RADIATION SAFETY OFFICER

1. Ensure that all users of radiation are conducted safely, adhere to the conditions of the license and license application, and result in exposure to personnel which are As Low As Reasonably Achievable (ALARA).
2. Act as liaison agent with regulatory authorities, be available for assistance in inspection and audits, and notify the Agency:
 - A. In writing before making any change which would render the Application for Radioactive Materials License or Radioactive Materials License no longer accurate.
 - B. Immediately in the event of any radiation accident or incident.
 - C. Within 5 days of any positive leak test result of a sealed source.
 - D. Within 30 days in a report stating remedial action taken after accident or incident.
3. Be familiar with all applicable rules and regulatory guides, and assure that license applications are properly filled out and are submitted in a timely manner.
4. Ensure that all surveys, calibrations, and leak tests are performed in a timely manner.
5. Establish and maintain record systems as applicable for radiation area surveys, wipe tests, leak tests, calibration of instruments, personnel dosimetry reports and other records and other records as required.
6. If dosimetry is required, advise individual radiation workers of each high exposure report, and conduct a survey to determine the cause of all overexposure so as to preclude reoccurrence. Perform a quarterly review of occupational exposure to authorized users and workers to determine that the exposures are within the limits established for the ALARA program. Annually apprise each radiation worker of accrued dose.
7. Assure that individuals working with radiation have appropriate protective devices, including shielding, ventilation, clothing gloves, remote handling equipment (where necessary), and facilities which aid in keeping exposures ALARA.
8. Procedure and maintain an adequate number of operable and properly calibrated radiation survey instruments, of the appropriate range and type, and properly calibrated counting equipment (if applicant will assay contamination and leak tests).
9. Develop and maintain up-to-date operating and emergency procedures.
10. Perform, or caused to be performed, semi-annual inventory of all sealed sources received and possessed.
11. Post conspicuously "Notice to Employees", Form ARRA-6 and Notices of Items of Noncompliance resulting from Agency inspections.
12. Supply employers of terminated radiation personnel with radiation exposure record.
13. Establish and cause to be maintained inventory control of radioactive material, ensuring inventory never exceeds amounts licensed.

14. Keep, or cause to be kept, records of receipts of incoming radioactive material and surveys of incoming and outgoing shipments.
15. Ensure that all incoming and outgoing radioactive shipments are properly packaged and labeled according to DOT requirements, and that shipments are accompanied by proper shipping papers.
16. Assure that radioactive materials are disposed of properly, and that records are maintained of all radioactive wastes disposed.
17. Perform an annual review of radiation safety program for adherence to ALARA concepts. Ensure that the safety program is followed by all workers dealing with radioactive materials. Investigate any deviation from the program, and take any remedial action necessary.
18. Schedule briefings and educational sessions to inform workers of radiation safety rules and procedures: 1) for all new personnel, 2) with each change in license condition or safety program, and 3) at intervals not to exceed 12 months in a refresher course for all personnel. This includes instruction in the ALARA program and the philosophy.
19. Apprise and inform management of radiation safety status and their responsibilities in maintaining an adequate radiation safety program.
20. Take charge in all emergency situations (spills, or release of radioactive material, etc.) To make sure correct emergency decontamination and protection procedures are carried out. Also, evaluate the situation that lead to the emergency in order to reduce the chance of recurrence.
21. Assure that radioactive materials are used by individuals authorized by the license.
22. Assure that radioactive materials are properly secured against unauthorized removal.

The RSO should have some formal training in radiological health (i.e., college level or its equivalent) and should have specific experience in radiation protection with the types, quantities, and use of the radioactive material to be used under the license.

SIGNED _____ DATE _____

ATTACHMENT C

CALIBRATION OF SURVEY INSTRUMENTS

Radiation survey meters shall be calibrated with a radioactive source. Electronic calibrations are not acceptable.

1. The source shall approximate a point source.
2. The source activity or exposure rate at a given distances shall be traceable by documented measurements to a standard source certified within five percent accuracy to the U.S. National Institute of Standards and Technology (NIST) calibrations.
3. The frequency shall be at intervals not to exceed 12 months and after servicing. Battery changes are not considered "servicing".
4. A source that has the same photon energy as the environment in which the calibrated device will be employed should be used for the calibration.
5. The exposure rate measured on the instrument scale shall differ from the true exposure rate by less than 10 percent at the point of measurement.
6. The source used must be of sufficient strength to give an exposure rate of 700 mR/hr at 20 cm. Minimum activities of typical sources are 85 mCi of Cs-137, 21 mCi of Co-60, and 34 mCi of Ra-226.
7. The inverse square law and the radioactive decay law must be used to correct for change in exposure rate due to changes in distance or source decay.
8. The following 3 kinds of scales are frequently used on survey meters:
 - A. Meters on which the user selects a linear scale must be calibrated at no less than two points on each scale. The points should be at approximately 1/3 and 2/3 of full scale.
 - B. Meters that have a multidecade logarithmic scale must be calibrated at no less than 1 point on each decade and no less than 2 points on 1 of the decade. Those points should be at approximately 1/3 and 2/3 of the decade.
 - C. Meters that have an automatically ranging digital display device for indicating rates must be calibrated at no less than one point on each decade and at no less than two points on one of the decades. Those points should be at approximately 1/3 and 2/3 of the decade.
9. A record must be made of each survey meter calibration.
10. At the time of calibration, the apparent exposure rate from a built-in or owner-supplied check source must be determined and recorded.
11. The report of a survey meter calibration should indicate the procedure used and the data obtained. The description of the calibration will include:
 - A. The owner or user of the instrument;
 - B. A description of the instrument that includes manufacturer, model number, serial number, and type of detector;

- C. A description of the calibration source, including exposure rate at a specified distance on specified date;
 - D. For each calibration point, the calculated exposure rate, the indicated exposure rate, the deduced correction factor (the calculated exposure rate divided by the indicated exposure rate), and the scale selected on the instrument.
 - E. The reading indicated with the instrument in the “battery check” mode (if available on the instrument).
 - F. The angle between the radiation flux field and the detector (for external cylindrical GM or ionization-type detectors, this will usually be “parallel” or “perpendicular” indicating photons traveling either parallel with or perpendicular to the central axis of the detector; for instruments with internal detectors, this should be the angle between the flux field and a specified surface of the instrument);
 - G. For detectors with removable shielding, an indication of whether the shielding was in place or removed during the calibration procedures;
 - H. The apparent exposure rate from the check source; and
 - I. The name of the person who performed the calibration and the date on which the calibration was performed.
12. The following information will be attached to the instrument as a calibration sticker or tag:
- A. The source that was used to calibrate the instrument;
 - B. The proper deflection in the battery check mode (unless this is clearly indicated on the instrument);
 - C. For each scale or decade, one of the following as appropriate:
 - (1.) The average correction factor; or
 - (2.) A graph or graphs from which the correction factor for each scale or decade may be deduced;
 - D. The angle between the radiation flux and the detector during the calibration; and
 - E. The apparent exposure rate from the check source.
13. See Figure C-1 for a form which may be used. If a different form will be used, attach a copy to this attachment when submitted with the application.

SIGNED _____ DATE _____

FIGURE C-1
SURVEY METER CALIBRATION REPORT

OWNER: _____ DEPARTMENT: _____

MANUFACTURER: _____ TYPE: ION CHAMBER GM TUBE

NaI (T1) (Scintillation)

OTHER: _____

MODEL: _____ SERIAL NUMBER: _____

PROBE: _____ PROBE SERIAL NUMBER: _____

CALIBRATION SOURCE: _____ mCi of _____ or _____ mR/hr at _____ on _____

Manufacturer _____ Model _____

NIST Traceable Yes _____ No _____

INSTRUMENT CHECKS: BATTERY CHECK: _____ mR/hr or _____

CONSTANCY CHECK: CHECK SOURCE INDICATES _____ mR/hr

_____ of _____ INDICATES
_____ mR/hr

CALIBRATION GEOMETRY: _____

WINDOW: OPEN CLOSED FIXED

DIST (feet)	mR/hr Today	SCALE: Reading	CORFAC	SCALE: Reading	CORFAC	SCALE: Reading	CORFAC

CORRECTION FACTORS: _____

DIST (feet)	mR/hr Today	SCALE: Reading	CORFAC	SCALE: Reading	CORFAC	SCALE: Reading	CORFAC

CORRECTION FACTORS: _____

ATTACHMENT D

MODEL SURVEY PROGRAM (NON-CONTAINED SOURCES)

1. Clothing, hands, and all primary work areas (except as in 2 below) shall be surveyed daily with an appropriate low-range radiation detection survey meter and decontaminated if necessary. For low energy beta emitters, appropriate wipe samples shall be taken in lieu of direct measurement.
2. Laboratory areas where only small quantities of radioactive materials are used (less than 10 microcuries of I-125 or I-131 or 100 microcuries of other non-special nuclear material or source material isotopes) will be surveyed monthly.
3. Waste storage areas and all other laboratory areas will be surveyed weekly.
4. The weekly and monthly surveys will consist of:
 - a. A measurement of radiation levels with a radiation detection survey meter sufficiently sensitive to detect 0.02 mR/hr.
 - b. A series of wipe tests to measure contamination levels. The method for performing wipe test will be sufficiently sensitive to detect the isotope specific levels in Table D-1. "High background" areas will not be used for contamination measurements.
5. A permanent record will be kept of all survey results, including negative results. The record will include:
 - a. Location, date, and identification of equipment used, including the serial number and pertinent counting efficiencies.
 - b. Name of person conducting the survey.
 - c. Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, ect.
 - d. Measured exposure rates, keyed to location on the drawing (point out rates that require correction action). Note - Correct survey instrument and appropriate action level should be listed on the survey record.
 - e. Detected contamination levels keyed to locations of drawing.
 - f. Corrective action taken in the case of contamination or excessive exposure rates, reduced contamination levels or exposure rate after corrective action, and any appropriate comments.
6. Area will be cleaned if the contamination level exceeds the levels in Table D-1.

SIGNED _____ DATE _____

TABLE D-1

Recommended Action Levels in dpm/100 cm² for Surface Contamination by Radionuclide

Facility Location	P-32, Co-58, Fe-59, Co-60 Se-75, Sr-85, In-111, I-123 I-125, I-131, Yb-169, Au-198	C-14, H-3, P-33, Cr-51 C0-57, Ga-67, Tc-99m Hg-197, Tl-201
Unrestricted areas, personal clothing	200	2,000
Restricted areas, protective clothing used only in restricted areas, skin	2,000	20,000

* If the isotope in question is not listed justify the action level that will be used.

ATTACHMENT E
REQUIRED RECORDS

Radioactive material licensees are required to maintain a number of records. This form is designed to simplify your task of complying with the rules in regard to record keeping. The different record requirements are listed below. It is your responsibility to develop your own records and ensure that all required records are accounted for.

As the Form ARRA-L Application Form is used for a wide variety of laboratory uses of radioactive materials, this attachment may list a number of records which may not apply to all users. If a record described in the attachment is for some material or equipment that you will not have, write N/A in the space to the right of the record description. If the need for a particular record would arise only rarely, you need not compose a special form for that record, but may document the required information by letter or memo.

<u>SECTION (ARS or AAC)</u>	<u>TYPE OF RECORD</u>	<u>FORM CODE NO.</u>
§ 30-657	General provisions require records of receipt, transfer, and disposal of all sources of radiation.	_____
R12-1-441	Records documenting disposals made under R12-1-434, 435, 436, 437, 438 and 439. Particular attention should be made to disposals made by release into sanitary sewerage systems in order to show compliance with limits set in R12-1-436.	_____
R12-1-418(E) & R12-1-419(C)	Records showing the radiation exposures of all individuals for whom personnel monitoring is required under R12-1-418. (May use Form Z or vendor's film badge exposure reports.)	_____
R12-1-403	Records of employee's prior use history. (May use Form Y.)	_____
R12-1-417	Records of all leak tests.	_____
R12-1-418(E)	Records of surveys as necessary to establish compliance with rules and to evaluate the extent of radiation hazards. (This includes receipt surveys, contamination survey, etc.)	_____
R12-1-1003	Records of instructions to workers.	_____

NOTE: Where records of surveys and monitoring are required, the records must show the units used in this part, i.e., millirem per hour for external radiation, microcuries for removable contamination, etc. It is not sufficient to just indicate that a survey was performed. (The survey report **should** also give a numerical interpretation of background, and not state merely that the reading was less than background.)

ATTACHMENT F

PERSONNEL TRAINING PROGRAM

1. The Radiation Safety Officer or (title) _____ shall provide instruction to radiation workers. Instruction shall include, but is not limited to:
 - A. General radioactive materials safety rules;
 - B. Personnel monitoring program (e.g., use, exchange, storage, records, and reports);
 - C. Radiation and contamination survey program;
 - D. Accident, incident, and emergency procedures;
 - E. Radioactive materials work procedures;
 - (1.) Ordering, receipt and opening procedures,
 - (2.) Storage,
 - (3.) Use of radioactive materials,
 - (4.) Waste packaging and storage, and
 - (5.) Transportation procedures.
 - F. Applicable state rules and license conditions; and
 - G. Their responsibility to report promptly any condition which may lead to or cause a violation of Agency rules and license conditions or unnecessary exposure to radiation or radioactive material.

2. The Radiation Safety Officer or (title) _____ shall provide instructions to ancillary personnel, such as clerical, janitorial, and security personnel, whose duties may require them to work in the vicinity of radioactive material. The instruction shall include, but not be limited to:
 - A. All terms of the license pertinent to radiation safety;
 - B. Identification of areas where radioactive material is used or stored;
 - C. Potential hazards associated with radioactive material;
 - D. Radiological safety procedures appropriate to their respective duties;
 - E. Pertinent state rules;
 - F. Rules and procedures of the license;
 - G. Obligation to report unsafe conditions to the RSO;

- H. Appropriate response to emergencies or unsafe conditions;
- I. Right to be informed of their radiation exposure and bioassay results; and
- J. Locations where the licensee has posted or made available notices, copies of pertinent rules, and copies of pertinent licenses and license conditions (including applications and applicable correspondence), as required AAC R12-1-1002.

The Radiation Safety Officer shall verify that personnel will be properly instructed before assuming duties with, or in the vicinity of, radioactive materials, during annual refresher training, and whenever there is a significant change in duties, rules, or the terms of the license.

SIGNED _____ DATE _____

ATTACHMENT G

GENERAL RULES FOR SAFE USE OF RADIOACTIVE MATERIAL

1. Wear lab coats or other protective clothing at all times in areas where dispersible radioactive materials are used.
2. Wear disposable gloves at all times while handling dispersible radioactive materials.
3. Monitor hands and clothing for contamination after each procedure or before leaving the area.
4. Use shielding and remote tools when working with millicurie or greater quantities of radioactive materials.
5. A. Do not eat, drink, smoke, or apply cosmetics in any area where radioactive material is stored or used.
B. Do not store food, drink, or personal effects with radioactive material (e.g., in refrigerator).
6. When appropriate, wear personnel monitoring devices (film badge or TLD) while using radioactive materials. These devices should be worn at chest or waist level. Personnel monitoring devices when not being worn should be stored in a designated low background area.
7. Wear TLD finger badges when manipulating millicurie or greater quantities of radioactive materials.
8. Dispose of radioactive waste only in specially designated drains or properly shielded receptacles.
9. Never pipette by mouth.
10. Survey lab work area for contamination after each procedure or at the end of the day. Decontaminate if necessary.
11. Confine radioactive solutions in covered containers plainly identified and labeled with name and compound, radionuclide, date, activity, and radiation level, if applicable.
12. Always transport radioactive material in shielded containers.
13. Use remote tools when handling sealed sources.
14. Leak test nuclear gauges in the locked, stored, or safe position (but only if license authorizes it).

SIGNED _____ DATE _____

ATTACHMENT H

WASTE DISPOSAL

NOTE: In view of the recent problems with shallow-land burial sites used by commercial waste disposal firms, licensees are encouraged to reduce the volume of waste sent to these facilities. Important steps in volume reduction are to segregate radioactive waste from nonradioactive waste, to hold short-lived radioactive waste for decay in storage, and to release certain materials into the sanitary sewer in accordance with AAC R12-1-436.

1. Liquid waste will be disposed of (check as appropriate):

In the sanitary sewer system in accordance with AAC R12-1-436 (also see Item 4 below).

By commercial waste disposal service (see also Item 3 below).

Other (specify) : _____

2. Other solid waste will be (check as appropriate):

Returned to manufacturer for disposal.

Held for decay until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels will be removed or obliterated, and the waste will be disposed of in normal trash.

By commercial waste disposal service (see also Item 3 below).

Other (specify) : _____

3. The commercial waste disposal service used will be:

NAME	CITY	STATE

Radioactive Materials License No. _____

4. Sanitary sewer radioactive material disposal concentration calculation.

A. Determine the total volume of sewer per month: _____ ml

Note: The total volume of sewage may be estimated by averaging the volume as stated on a sewage bill or the volume of water used by a facility as stated on the water bill.

Useful conversions: 1 cubic foot = 3.838 x 10⁴ ml
1 gallon = 3.78 x 10³ ml

B. Determine allowable activity for each isotope disposed of via the sanitary sewer per month:
(See Schedule B in Article 4 to obtain these values)

	ISOTOPE	ACTIVITY (MICROCURIES/ML)
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

C. For each isotope, divide the activity (microcuries) by the monthly volume (ml):
(Activity should be the estimated quantity of each isotope used on a monthly basis)

	ISOTOPE	ACTIVITY/MONTHLY VOLUME	= AVERAGE MONTHLY CONCENTRATION
1.	_____	_____ uCi/ _____ ml	= _____ uCi/ml
2.	_____	_____ uCi/ _____ ml	= _____ uCi/ml
3.	_____	_____ uCi/ _____ ml	= _____ uCi/ml
4.	=====	===== uCi/ ===== ml	= ===== uCi/ml
5.	_____	_____ uCi/ _____ ml	= _____ uCi/ml

D. To determine compliance, refer to AAC Article 4, Appendix B.

E. By signing this form it is agreed the waste disposal information, procedures, and computations are correct, and that the combined total of radioactive waste going into the sewer system does not exceed unity, as required in R12-1-436(A)(3)(b).

SIGNED _____ DATE _____

ATTACHMENT I

MODEL EMERGENCY PROCEDURES

MINOR SPILLS (Defined as: _____)

1. NOTIFY: Notify persons in the area that a spill has occurred.
2. PREVENT THE SPREAD: Cover the spill with absorbent paper.
3. CLEAN UP: Use disposable gloves and remote handling tongs. Carefully fold the absorbent paper and pad. Insert into a plastic bag and dispose in the radioactive waste container. Also, insert into the plastic bag all other contaminated materials such as disposable gloves.
4. SURVEY: With a low-range, thin-window GM survey meter, check the area around the spill, hands, and clothing for contamination.
5. REPORT: Report the incident to the Radiation Safety Officer.

MAJOR SPILLS (Defined as: _____)

1. CLEAR THE AREA: Notify all persons not involved in the spill to vacate the room.
2. PREVENT THE SPREAD: Cover the spill with absorbent pads, but do not attempt to clean it up. Confine the movement of all potentially contaminated personnel to prevent the spread.
3. SHIELD THE SOURCE: If possible, the spill should be shielded, but only if it can be done without further contamination or without significantly increasing your radiation exposure.
4. CLOSE THE ROOM: Leave the room and lock the door (s) to prevent reentry.
5. CALL FOR HELP: Notify the Radiation Safety Officer immediately.
6. 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 and wash with mild soap and lukewarm water.

RADIATION SAFETY OFFICER: _____

OFFICE PHONE: _____

HOME PHONE: _____

LOSS, THEFT, FIRE EXPLOSION, OR VEHICLE ACCIDENT

1. SECURE THE AREA AROUND THE ACCIDENT. Keep unauthorized persons away. Alert people of the presence of radioactive material and potential hazard.

2. DO NOT LEAVE THE SITE. Send a helper or onlooker to notify the following:

RADIATION SAFETY OFFICER: _____

WORK PHONE: _____ HOME PHONE: _____

LOCAL POLICE: _____

LOCAL FIRE DEPARTMENT (where applicable) : _____

3. The Radiation Safety Officer, in turn, must immediately notify the Arizona Radiation Regulatory Agency Emergency Response Program at (602) 255-4845, and other local authorities as required.

4. The radiation worker should inform emergency workers of the potential radiation hazard and its location; and help them keep the area secure. In no case should the radiation worker leave the site until qualified experts arrive, unless, seriously injured or incapacitated, and must be removed from the site for medical care.

ALTERNATE NAMES AND TELEPHONE NUMBERS DESIGNATED BY THE RADIATION SAFETY OFFICER:

_____	_____
_____	_____
_____	_____
_____	_____

SIGNED _____ DATE _____

ATTACHMENT J

**PROCEDURES FOR ORDERING AND ACCEPTING
DELIVERY OF RADIOACTIVE MATERIAL**

1. The Radiation Safety Officer or his designee will place all orders for radioactive materials and will ensure that the requested materials and quantities are authorized by the license.
2. A system for ordering and receiving materials will be established and maintained. The system will consist minimally of the following:
 - A. Ordering of routinely used materials:
 - (1.) A written record will be established that identifies the isotope, compound, activity levels, and supplier.
 - (2.) The written records will be referenced when opening or storing radioactive shipments.
 - B. Ordering of specially used materials:
 - (1.) A written request will be obtained from an authorized user who will perform the procedure.
 - (2.) Persons ordering the materials will reference the authorized user's written request when placing the order.
 - (3.) The authorized user's written request will be referenced when receiving, opening, or storing the radioactive material.
 - C. Maintain written records of all orders and receipts for 3 years.
3. During normal working hours, carriers will deliver radioactive packages directly to a designated laboratory or to some other official receiving area for radioactive materials.
4. During off-duty hours, security or other designated individuals will accept delivery of radioactive packages in accordance with the procedures outlined in the attached memorandum.

SIGNED _____ DATE _____

SAMPLE MEMORANDUM*

TO: Security Personnel _____
FROM: Administrator _____
SUBJECT: RECEIPT OF PACKAGES CONTAINING RADIOACTIVE MATERIAL

Any packages containing radioactive material that arrive between 4:30 p.m. and 7:00 a.m. or on weekends shall be signed for by the security guard on duty and be taken immediately to the previously described laboratory. Place the package in a secure location within the designated laboratory.

If the package is wet or appears to be damaged, immediately contact the company Radiation Safety Officer. Ask the carrier to remain until it can be determined that neither the driver nor the delivery vehicle is contaminated.

RADIATION SAFETY OFFICER: _____

OFFICE PHONE: _____

HOME PHONE: _____

*** Submit a copy of your own company's memorandum with the procedures for ordering and receiving packages of radioactive materials.**

ATTACHMENT K

**PROCEDURES FOR SAFELY OPENING PACKAGES
CONTAINING RADIOACTIVE MATERIAL**

1. Special requirements will be followed for packages containing quantities of radioactive material in excess of the Type A quantity limits specified in AAC R12-1-433. Packages will be monitored for surface contamination and external radiation levels within three hours after receipt if received during normal working hours or within 18 hours if received after normal working hours, in accordance with the requirements in AAC R12-1-433. All shipments of liquids greater than exempt quantities will be tested for leakage. The Agency will be notified in accordance with R12-1-433(D) if removable contamination exceeds 22 dpm/cm² for beta/gamma emitting radionuclides or 2.2 dpm/cm² for alpha emitting radionuclides, wiping a minimum area of 300 square centimeters or entire surface if package is less than 300 square centimeters; or if external radiation levels exceed 200 mR/hr at the package surface or 10 mR/hr at 3 feet (or 1 meter). Note - See attached flow diagram and package receipt and monitoring record..
2. The following procedure for opening a package will be followed:
 - A. Put on gloves to prevent hand contamination.
 - B. Visually inspect the package for any sign of damage (e.i., wet or crushed). If damage is noted, stop the procedure and notify the RSO.
 - C. If the package is undamaged and unlabeled with a White I, Yellow II, or Yellow III, proceed to the opening procedure under Letter E. If the package contains greater than exempt quantities, but less than the Type A quantities listed in 10CFR Part 71.4 wipe test the outer surface for contamination and notify the RSO if the action levels in R12-1-433 are exceeded. If the package contains greater than Type A quantities go to Letter D
 - D. Measure the exposure rate at a meter from the package and at the package surface. The readings should not exceed 10 mR/hr at a meter and 200 mR/hr at the surface of the package. If the readings are greater than these action levels, stop the procedure and notify the RSO; otherwise proceed with the opening procedure.
 - E. Open the package with the following precautionary steps:
 - (1.) Remove the package 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 packaging slip. Compare requisition, packing slip and label. In the case of special orders, also compare with authorized user's written request.
 - (4.) Check the integrity of the final container. Look for broken seals or vials, loss of liquid, condensation, or discoloration of the packaging material.
 - (5.) If anything is other than expected, stop and notify the RSO.
 - F. Wipe the external surface of the final container and remove the wipe to a low background area. Appropriate for the radionuclides in question, assay or survey the wipe sample for removable contamination. Check wipes with a thin end-window GM survey meter or other appropriate counting instrument, and take precautions against the spread of contamination as necessary. Decontaminate the outside of the container if needed.

G. If possible, survey the packaging material for contamination before discarding.

(1.) If contaminated, treat as radioactive waste.

(2.) If not contaminated, obliterate radiation labels before discarding in regular trash.

3. Maintain records of the package surveys. Figure K-1 is an example form which will be used to record the package surveys. An alternate form may be used , however, the same information will be recorded.

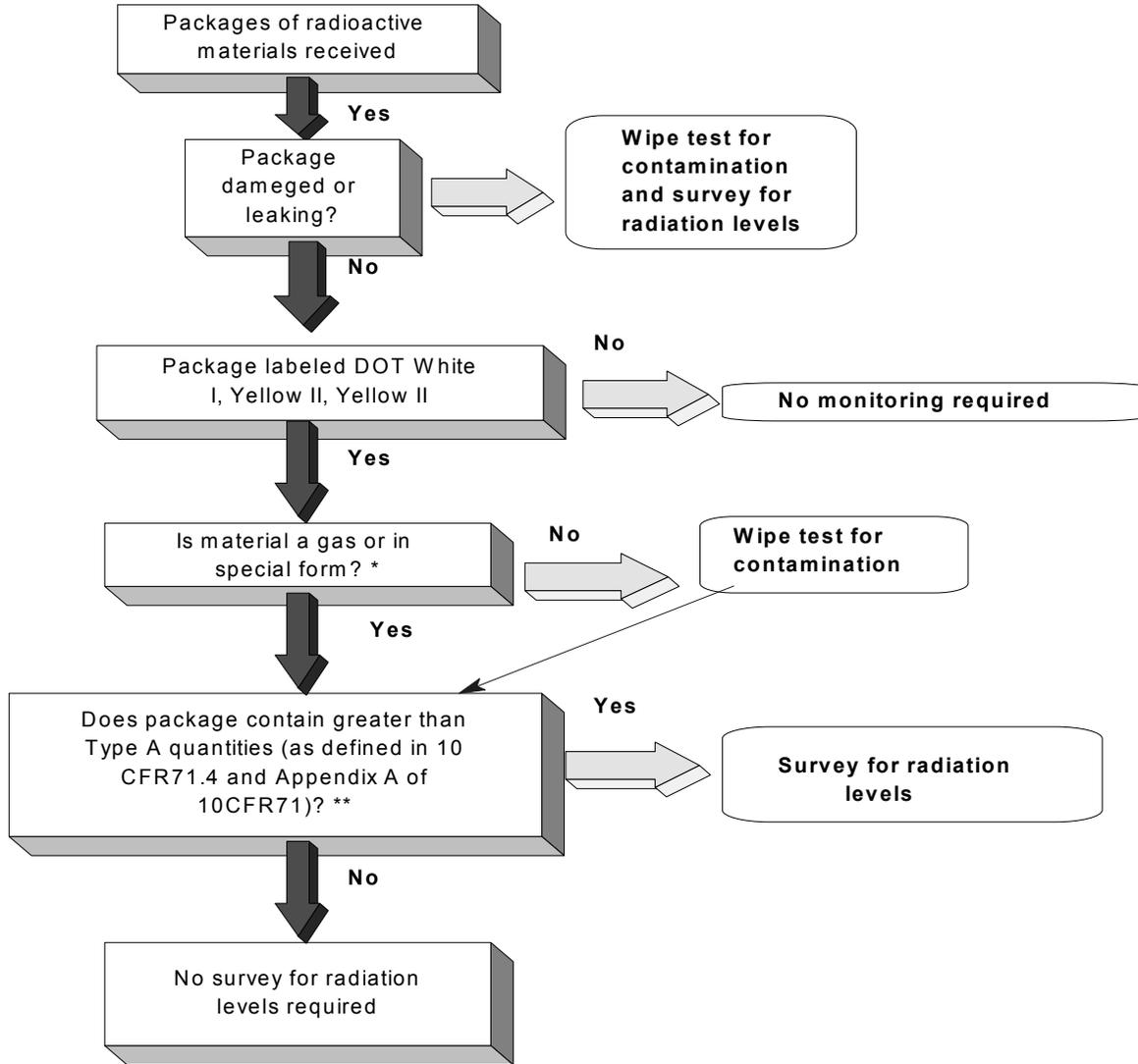
SIGNED _____ DATE _____

FIGURE K-1

PACKAGE RECEIPT AND MONITOR LOG			
MANUFACTURER_____	ISOTOPE_____	ACTIVITY_____	
P.O. NUMBER_____	DATE_____	SURVEYOR_____	
SURVEY OR TEST	YES	NO	COMMENTS
Condition of package OK	()	()	_____
Radiation levels agree w/label	()	()	_____
Contents & package slip agree	()	()	_____
Contamination of packing materials	()	()	WIPE TEST_____
Contamination of source	()	()	WIPE TEST_____
If no removable contamination is found, obliterate labels and dispose of box and packing materials in ordinary trash.			

PACKAGE RECEIPT AND MONITOR LOG			
MANUFACTURER_____	ISOTOPE_____	ACTIVITY_____	
P.O. NUMBER_____	DATE_____	SURVEYOR_____	
SURVEY OR TEST	YES	NO	COMMENTS
Condition of package OK	()	()	_____
Radiation levels agree w/label	()	()	_____
Contents & package slip agree	()	()	_____
Contamination of package materials	()	()	WIPE TEST_____
Contamination of source	()	()	WIPE TEST_____
If no removable contamination is found, obliterate labels and dispose of box and packing materials in ordinary trash.			

PACKAGE RADIATION MONITORING



* Special form material refers to sealed sources unlikely to be dispersed if involved in an accident. A more complete definition of special form material is contained in 10CFR71. Very few materials received by medical facilities are of special form.

** The type A quantities (in curies) are higher than most medical facilities normally receive. Below is a table of some common medical radionuclide Type A quantities.

<u>Radionuclide</u>	<u>Quantity in Curies Special Form (A1)</u>	<u>Quantity in Curies Normal Form (A2)</u>
C-14	1000	60
Cs-137	30	10
H-3	1000	1000
I-131	40	10
Mo-99	100	20
P-32	30	30
Sr-89	100	10
Tc-99m	100	100
Tl-201	200	200

Figure G-2 9/99

ATTACHMENT L

Legal Structure of the Applicant

8. LEGAL STRUCTURE OF APPLICANT

An Individual ___ A Partnership ___ A Limited Liability Corporation ___ A Corporation ___
An Unincorporated Association ___ City/County/State Government ___

A Partnership

Please provide the name and address of each individual or legal entity owning a partnership interest in the applicant.

Please state the percentage ownership of the applicant partnership held by each of the individuals or legal entities listed above.

A Limited Liability Corporation

Memberships

Ownerships

A Corporation
STOCK OF APPLICANT CORPORATION

# AUTHORIZED SHARES	# ISSUED SHARES	# SUBSCRIBED SHARES	TOTAL STOCKHOLDERS	TOTAL SUBSCRIBERS

Is the applicant corporation directly or indirectly controlled by another corporation or other legal entity?
If "yes" give name and address of other corporation or legal entity and describe how such control exists and the extent of control.

For all entities, please identify the State, District, or Territory under the laws of which the applicant is organized. Include the name and address of any Arizona agent for the applicant.

9. The applicant or any official executing this application on behalf of the applicant certifies that this application has been prepared in accordance with Arizona Administrative Code, Title 12, Chapter 1, and all information contained on this form, including any supplements and attachments, is true and correct to the best of his or her knowledge and belief.

DATE APPLICANT (ITEM 1) BY TITLE
